STANDBY REVENUE RECYCLING AUTHORITY TO DEAL WITH PETROLEUM SUPPLY DISRUPTIONS

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND AGRICULTURAL TAXATION

OF THE

COMMITTEE ON FINANCE UNITED STATES SENATE

NINETY-SEVENTH CONGRESS

FIRST SESSION

DECEMBER 8, 1981

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STANDBY REVENUE RECYCLING AUTHORITY TO DEAL WITH PETROLEUM SUPPLY DISRUPTIONS

TUESDAY, DECEMBER 8, 1981

U.S. SENATE,
SUBCOMMITTEE ON ENERGY AND AGRICULTURAL TAXATION
OF THE SENATE FINANCE COMMITTEE,
Washington, D.C.

The hearing was convened, pursuant to notice, at 9:45 a.m., in room 2221, Dirksen Senate Office Building, Hon. Malcolm Wallop (chairman) presiding.

Present: Senators Wallop, Durenberger, Bradley, and Long.

[The committee press release announcing this hearing; the bill S. 1354, and the description of this bill by the Joint Committee on Taxation follow:]

[Press Release No. 81-181]

FINANCE SUBCOMMITTEE ON ENERGY AND AGRICULTURAL TAXATION SETS HEARING ON THE TAX ASPECTS OF S. 1354

Senator Malcolm Wallop, Chairman of the Subcommittee on Energy and Agricultural Taxation of the Senate Committee on Finance, announced today that the subcommittee will hold a hearing on the tax aspects of S. 1354 on Tuesday, December 8, 1981.

The hearing will begin at 9:30 a.m. on December 8, 1981, in room 2221 of the Dirksen Senate Office Building.

S. 1354, which was introduced by Senators Bradley and Percy, would, inter alia, require the President to develop a standby plan to recycle Federal tax revenues during an oil supply disruption. The plan would be required to include emergency changes in income tax withholding rates, and adjustments to the crude oil windfall profit tax. The bill would also require the President to submit a report on the merits of reducing the tax liability on persons who draw down oil reserves during a supply disruption and on the need for tax incentives for the construction of private sector oil storage facilities and the maintenance of increased oil reserves.

II

97TH CONGRESS
1ST SESSION

S. 1354

To provide standby authority to deal with petroleum supply disruptions, and for other purposes.

IN THE SENATE OF THE UNITED STATES

JUNE 11 (legislative day, JUNE 1), 1981

Mr. BRADLEY (for himself and Mr. PERCY) introduced the following bill; which was read twice and referred to the Committee on Finance

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A BILL

To provide standby authority to deal with petroleum supply disruptions, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. (a) SHORT TITLE.—This Act may be cited as the "Emergency Preparedness Act of 1981".

(b) TABLE OF CONTENTS.—

Sec. 1. Short title; table of contents.
Sec. 2. Statement of findings and purposes.
Sec. 3. Definitions.

TITLE I—STANDBY REVENUE RECYCLING AUTHORITY

Sec. 101. Standby recycling authority.
Sec. 102. Approval of proposed standby plan.

Sec. 103. Implementation of the approved standby plan.
Sec. 104. Reimbursement to States.
Sec. 105. Expiration.

TITLE II—USE OF THE STRATEGIC PETROLEUM RESERVE

Sec. 201. Crude oil access.
Sec. 202. Amendments to the Strategic Petroleum Reserve Plan.

TITLE III—INVESTIGATIONS AND REPORTS

Sec. 301. Oil storage tax incentives.
Sec. 302. International cooperation.

STATEMENT OF FINDINGS AND PURPOSES

SEC. 2. (a) Congress finds and declares that—

(1) disruptions in the supply of imported oil are likely during the next decade;

(2) such emergencies will disrupt normal petroleum market operations; standby sources of supply of crude oil, such as strategic stockpiles, should be used to mitigate the potential for market turmoil;

(3) if oil stockpiles are unavailable or insufficient to fully offset the reduction in oil available to the world oil market, oil prices will rise, possibly rapidly and to high levels;

(4) without compensating action, such high prices will create severe economic dislocations and individual hardships;

(5) if Federal action is not taken to ameliorate these economic consequences of disruptions, individual states may be compelled to implement differing, perhaps less efficient emergency programs;

(6) severe oil supply disruptions constitute a threat to public health, safety, and welfare which can most effectively, efficiently, and equitably be dealt with through prompt fiscal action by the executive branch of Government; and

(7) no emergency program will be able to avoid entirely the market disruptions and personal hardships that will accompany a petroleum supply disruption; however, prompt fiscal action by the executive branch of Government will reduce individual hardships and economic dislocations more effectively than other mechanisms used in the past.

(b) The purpose of this Act is to grant the President of the United States authority during severe supply disruptions of crude oil to recycle Federal tax revenues to United States residents and State Governors for further distribution. The authority granted under this Act shall be exercised only for the purpose of minimizing the adverse effects of such supply disruptions on the Nation.

DEFINITIONS

SEC. 3. As used in this Act:

(1) The term "United States" means the several States, the Commonwealth of Puerto Rico, the District of Columbia, and the trusts and territories of the United States.

(2) The term "State" means the 50 States, the Commonwealth of Puerto Rico, the District of Columbia, or the trusts and territories of the United States.

(3) The term "severe petroleum supply disruption" means a reduction in the volume of oil available to the world oil market which the President determines—

(A) is the primary cause or is likely to be the primary cause of a 20-percent increase in the world price of petroleum products over a 3-month period; and

(B) is having or can reasonably be expected to have a major adverse effect on public health, safety, or welfare, or the national economy. A severe petroleum supply disruption exists only as long as either the world price of petroleum products remains above the predisruption level or the volume of oil available to the world oil market remains below the predisruption level.

(4) The term "to recycle Federal tax revenues" means to rapidly return to the economy the increased revenues of the Federal crude oil windfall profit tax (Public Law 96–223), or other disruption-related, increased Federal revenues, that the President deter-

mines have resulted or are likely to result from a severe petroleum disruption.

(5) The term "refined petroleum products" means gasoline, kerosene, distillates (including Number 2 fuel oil), liquid petroleum gases, refined lubricating oils, diesel fuel, and residual fuel.

(6) The term "world price of petroleum products" means a weighted average of spot and contract prices as reported in several world marketing centers as determined by the President.

TITLE I—STANDBY REVENUE RECYCLING AUTHORITY

STANDBY RECYCLING AUTHORITY

SEC. 101. (a) Not later than 180 calendar days after the date of the enactment of this title, the President shall submit a proposed standby plan to Congress which when implemented will permit the President to recycle Federal tax revenues both to State Governors for further distribution and to residents of the United States.

(b) The proposed standby plan under subsection (a), to the maximum extent practicable, shall provide for—

(1) economic efficiency in all sectors of the economy;

(2) the mitigation of extreme personal hardship caused by the severe petroleum supply disruption;

(3) the national defense and other essential services for the public;

(4) the protection of public safety, health, and welfare;

(5) the prompt recycling of Federal tax revenues commencing as soon as practicable after the President determines the existence of a severe petroleum supply disruption;

(6) assurances that each resident of the United States is eligible for assistance under this title;

(7) procedures by which the President would ensure that highest priority is given to the enforcement of antitrust statutes that will guard against anticompetitive practices during severe petroleum supply disruptions; and

(8) the fulfillment of international treaty obligations.

(c) The plan providing for the recycling of Federal tax revenues shall use a combination of emergency distribution of funds to State Governors for further distribution, emergency changes in withholding rates, reductions in payroll taxes, additions to social security and supplemental security income payments, or other distribution mechanisms that the President elects to address the objectives listed in (b). The proposed standby plan shall provide guidelines for State Gover-

nors and instructions for the Attorney General of the United States to ensure the objectives listed in (b) are met. Reasonable accounting and auditing procedures shall be established. The proposed standby plan shall be developed in consultation with State Governors and with the benefit of public participaton.

(d) The emergency distribution of funds to each State Governor shall enable each Governor, to the maximum extent practicable, to mitigate the effects of higher oil prices on low-income or otherwise disadvantaged people; public health, safety, and welfare activities in the State; essential public services in the State; economic efficiency; people experiencing extreme personal hardship; and other priority activities in the State as determined by the Governor.

(e) The proposed plan shall specify the formula by which the recycled Federal tax revenues will be distributed to the economy. To avoid disproportionate burdens on any one sector, income group, or region, the formula shall be designed to give priority to those individuals or regions who are most adversely affected and least capable of absorbing higher oil prices. The percentages of total recycled Federal tax revenues to be distributed to each of the following categories shall be specified in the proposed plan: Individuals via lower Federal income tax withholding rates, individuals via other Federal payments, each State Governor for further distribu-

tion to essential public services, each State Governor for further distribution to low-income or otherwise disadvantaged people, and other categories specified by the President.

(f) The proposed plan shall include adjustments and simplifications to the crude oil windfall profit tax (Public Law 96–233), that would eliminate the tax on oil discovered during and after the severe supply disruption and that would increase the tax rate on the incremental revenues resulting from the supply disruption. The adjusted tax shall apply to all oil flowing from wells in production prior to the disruption. In formulating the proposed plan, the President shall consider exempting from the windfall profit tax oil stored prior to the disruption.

APPROVAL OF PROPOSED STANDBY PLAN

SEC. 102. (a) The proposed standby plan transmitted to the Congress pursuant to section 101(a) shall bear an identification number and shall be transmitted to both Houses of Congress on the same day and to each House while it is in session.

(b) No such standby plan may be considered approved for purposes of section 103(a) of this title unless between the date of transmittal and the end of the first period of 60 calendar days of continuous session of Congress after the date on which action is transmitted to each House, each House of Congress passes a resolution described in subsection (d)(2).

(c) For the purpose of subsection (b) of this section—

(1) continuity of session is broken only by an adjournment of Congress sine die; and

(2) the days on which either House is not in session because of an adjournment of more than 3 days to a day certain are excluded in the computation of the 60-calendar-day period.

(d)(1) This subsection is enacted by Congress—

(A) as an exercise of the rulemaking power of the Senate and the House of Representatives, respectively, and as such it is deemed a part of the rules of each House, respectively, but applicable only with respect to the procedure to be followed in that House in the case of resolutions described by paragraph (2) of this subsection; and it supersedes other rules only to the extent that it is inconsistent therewith; and

(B) with full recognition of the constitutional right of either House to change the rules (so far as relating to the procedure of that House) at any time, in the same manner and the same extent as in the case of any other rule of the House.

(2) For purposes of this subsection, the term "resolution" means only a resolution of either House of Congress the matter after the resolving clause of which is as follows: "That the approves the standby plan num-

bered submitted to the Congress on , 19 .", the first blank space therein being filled with the name of the resolving House and the other blank spaces being appropriately filled.

(3) A resolution once introduced with respect to the standby plan shall immediately be referred to a committee by the President of the Senate or the Speaker of the House of Representatives, as the case may be.

(4)(A) If the committee to which a resolution with respect to the standby plan has been referred has not reported it at the end of the 20 calendar days after its referral, it shall be in order to move either to discharge the committee from further consideration of such resolution or to discharge the committee from further consideration of any other resolution with respect to such standby plan which has been referred to the committee.

(B) A motion to discharge may be made only by an individual favoring the resolution, shall be highly privileged (except that it may not be made after the committee has reported a resolution with respect to the standby plan), and debate thereon shall be limited to not more than 1 hour, to be divided equally between those favoring and those opposing the resolution. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(C) If the motion to discharge is agreed to or disagreed to, the motion may not be renewed, nor may another motion to discharge the committee be made with respect to any other resolution with respect to the standby plan.

(5)(A) When the committee has reported, or has been discharged from further consideration of, a resolution, it shall be at any time thereafter in order (even though a previous motion to the same effect has been disagreed to) to move to proceed to the consideration of the resolution. The motion shall be highly privileged and shall not be debatable. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(B) Debate on the resolution referred to in subparagraph (A) of this paragraph shall be limited to not more than 10 hours, which shall be divided equally between those favoring and those opposing such resolution. A motion further to limit debate shall not be debatable. An amendment to or motion to recommit the resolution shall not be in order, and it shall not be in order to move to reconsider the vote by which such resolution was agreed to or disagreed to.

(6)(A) Motions to postpone, made with respect to the discharge from committee or the consideration of a resolution, and motions to proceed to the consideration of other business shall be decided without debate.

(B) Appeals from the decision of the Chair relating to the application of the rules of the Senate or the House of Representatives, as the case may be, to the procedures relating to a resolution shall be decided without debate.

(e) If either House rejects a resolution described in subsection (d)(2), the President shall transmit to the Congress a revised proposed standby plan within 30 days of the rejection. The revised proposed standby plan shall be approved or rejected following the procedures of this section. The President shall continue to submit revised plans following the procedures of this section until a proposed plan is approved by both Houses of Congress.

IMPLEMENTATION OF THE APPROVED STANDBY PLAN

SEC. 103. (a) The President may implement the standby plan approved under section 102 whenever the President determines that a severe petroleum supply disruption exists and only with the passage of a joint resolution authorizing a specific amount of Federal tax revenues to be recycled. In the event of a severe petroleum supply disruption the President shall transmit evidence of the determination called for in the preceding sentence and a request for a joint resolution that specifies the amount of Federal tax revenues to be recycled according to the approved standby plan to both Houses of Congress on the same day.

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(b) No such joint resolution may be considered approved for purposes of subsection (a) unless, between the date of transmittal and the end of the first period of 6 calendar days of the date on which such action is transmitted to such House, each House of Congress passes the joint resolution described in subsection (d)(2).

(c) If the Congress is not in session the President may call the Congress into emergency session.

(d)(1) This subsection is enacted by Congress—

(A) as an exercise of the rulemaking power of the Senate and House of Representatives, respectively, and as such it is deemed a part of the rules of each House, respectively, but applicable only with respect to the procedure to be followed in that House in the case of joint resolutions described by paragraph (2) of this subsection; and it supersedes other rules only to the extent that it is inconsistent therewith; and

(B) with full recognition of the constitutional right of either House to change the rules (so far as relating to the procedure of that House) at any time, in the same manner and to the same extent as in the case of any other rule of the House.

(2) For purposes of this subsection, the term "joint resolution" means only a resolution of Congress as follows: "The President is authorized to implement the plan submitted by

the President and approved by Congress under the procedures of section 102 of the Emergency Preparedness Act of 1981. The President is authorized to recycle no more than $ over the 12-month period beginning on the date of enactment of this joint resolution." The blank in the joint resolution will be filled with the amount of Federal tax revenues to be recycled over the 12-month period beginning on the date of enactment of the joint resolution, but the President shall not recycle revenues in excess of the amount of incremental windfall profit tax revenues, or other disruption-related increased Federal revenues, collected during and as a primary result of the severe petroleum supply disruption.

(3) A joint resolution once introduced shall immediately be referred to the House Committees on Ways and Means and Energy and Commerce, and the Senate Committees on Finance and Energy and Natural Resources by the President of the Senate or the Speaker of the House of Representatives, as the case may be.

(4)(A) If the committee to which a joint resolution has been referred has not reported it at the end of 2 calendar days after its referral, it shall be in order to move either to discharge the committee from further consideration of such joint resolution or to discharge the committee from further consideration of any other joint resolution which has been referred to the committee.

(B) A motion to discharge may be made only by an individual favoring the joint resolution, shall be highly privileged, and debate thereon shall be limited to not more than 1 hour, to be divided equally between those favoring and those opposing the joint resolution. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(C) If the motion to discharge is agreed to or disagreed to, the motion may not be renewed, nor may another motion to discharge the committee be made with respect to any other joint resolution.

(5)(A) When the committee has reported, or has been discharged from further consideration of, a joint resolution, it shall be at any time thereafter in order (even though a previous motion to the same effect has been disagreed to) to move to proceed to the consideration of the joint resolution. The motion shall be highly privileged and shall not be debatable. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(B) Debate on the joint resolution referred to in subparagraph (A) of this paragraph shall be limited to not more than 10 hours, which shall be divided equally between those favoring and those opposing such joint resolution. A motion fur-

ther to limit debate shall not be debatable. An amendment to, or motion to recommit the joint resolution shall not be in order, and it shall not be in order to move to reconsider the vote by which such joint resolution was agreed to or disagreed to.

(6)(A) Motions to postpone, made with respect to the discharge from committee, or the consideration of a joint resolution and motions to proceed to the consideration of other business, shall be decided without debate.

(B) Appeals from the decision of the Chair relating to the application of the rules of the Senate or the House of Representatives, as the case may be, to the procedures relating to a joint resolution shall be decided without debate.

(e) The procedures described in (a) and (b) above may also be initiated by either House of Congress. If the President vetos the measure so initiated, the Congress may attempt to override the veto in the usual manner.

(f) The President may recycle revenues in addition to those initially requested under the procedures described in this section by submitting an additional request using the same procedure.

REIMBURSEMENT TO STATES

SEC. 104. The President may reimburse any State for expenses incurred by such State in preparation for or execu-

tion of responsibilities delegated to such State at its request by the President under this title.

EXPIRATION

SEC. 105. The provisions of this title shall cease to have effect on the date of expiration of the windfall profit tax (Public Law 96–223).

TITLE II—USE OF THE STRATEGIC PETROLEUM RESERVE

CRUDE OIL ACCESS

SEC. 201. Within 3 months after the date of enactment of this title, the President shall submit to Congress a report describing the advisability of competitive sales from the Strategic Petroleum Reserve to ensure emergency access to crude oil for particularly affected refiners in lieu of a standby crude oil allocation program. The study shall examine competitive sale or auction procedures, determination of eligible participants (for example, whether refiners serving rural or agricultural regions should receive priority in the competitive sale or auction), volumes to be made available for competitive sale or auction, minimum volumes of reserve to be maintained as necessary for wartime mobilization, and the use of the Reserve to meet international obligations.

AMENDMENTS TO THE STRATEGIC PETROLEUM RESERVE PLAN

SEC. 202. Within 6 months after the date of enactment of this title, the President shall submit an amendment to the Strategic Petroleum Reserve plan, in accordance with section 154 of Public Law 94–163, that would incorporate any procedures recommended by the study called for in section 201.

TITLE III—INVESTIGATIONS AND REPORTS

OIL STORAGE TAX INCENTIVES

SEC. 301. Within 6 months after the date of the enactment of this title, the President shall submit a full and detailed report on the advisability and alternative means of (1) reducing the tax liability of persons who draw down oil reserves during oil supply disruptions, and (2) providing tax or other incentives for the construction of private-sector oil storage facilities and the maintenance of increased private-sector oil reserves.

INTERNATIONAL COOPERATION

SEC. 302. Within 6 months after the date of the enactment of this title, the President shall submit a full and detailed report on the manner in which oil stockpile and demand restraint measures have been and may be coordinated among some or all allies and trading partners.

DESCRIPTION OF S. 1354
(EMERGENCY PREPAREDNESS ACT OF 1981)

Relating to

STANDBY REVENUE RECYCLING AUTHORITY TO DEAL WITH PETROLEUM SUPPLY DISRUPTIONS

BY THE

Subcommittee on Energy and Agricultural Taxation
of the
Senate Committee on Finance

on

December 8, 1981

Prepared by the Staff

of the

Joint Committee on Taxation

December 7, 1981

JCX-34-81

INTRODUCTION

The Senate Finance Subcommittee on Energy and Agricultural Taxation has scheduled a public hearing on December 8, 1981, on the tax aspects of S. 1354, the Emergency Preparedness Act of 1981. The bill (introduced by Senators Bradley and Percy) would require the President to develop a standby plan to recycle Federal tax revenues during an oil supply disruption (title I). The bill also would require the President to report to the Congress on the possibility of competitive sales of oil out of the strategic petroleum reserve as an alternative to a standby crude oil allocation program (title II). In addition, the bill would require the President to report to the Congress on the possible use of tax incentives to encourage increased oil storage by the private sector and more rapid use of inventories in the case of an oil supply disruption (title III). Titles I and III have been referred to the Committee on Finance for its consideration; and titles II and III have been referred to the Committee on Energy and Natural Resources.

This document, prepared in connection with the Subcommittee hearing, provides a description of the provisions of the bill. Part I is a summary of the bill. Part II is a brief description of the relevant provisions of present law; and Part III is an explanation of the provisions of each of the three titles of the bill.

I. Summary

Title I

The President would be required to submit to Congress a standby plan for recycling to U.S. residents and State governors the additional tax revenues which would result, from the crude oil windfall profit tax or from other sources, from a severe petroleum supply disruption. For it to go into effect, this plan would have to be approved by both Houses of Congress.

Title II

The President would be required to report to Congress on the possibility of competitive sales of oil out of the strategic petroleum reserve as an alternative to a standby crude oil allocation program.

Title III

The President would report to Congress on the use of tax incentives to encourage increased oil storage by the private sector and more rapid depletion of inventories in the case of an oil supply disruption.

II. Present Law

Windfall profit tax

Under the crude oil windfall profit tax, increases in price of crude oil lead to significant increases in Federal revenues. Currently a $1 per barrel increase in crude oil prices would increase revenues by approximately $750 million a year.

Oil import fee

The President has the authority, subject to congressional veto, to impose oil import fees in certain cases. These would also raise substantial amounts of revenue. For example, a $1 per barrel import fee would increase revenues by about $1-1/2 billion.

Strategic Petroleum Reserve

Current law provides for the creation of a Strategic Petroleum Reserve as a means of ameliorating the effect on domestic crude oil markets of a severe energy supply interruption. It also provides for the drawdown and distribution of the Reserve according to rules promulgated by the Secretary of Energy.

Currently, the Distribution Plan for the Strategic Petroleum Reserve describes the use of competitive pricing, under certain circumstances, as a means of crude oil allocation. It does not appear, however, that the advisability and methods of competitive sales of

petroleum products from the Strategic Petroleum Reserve as a means of assuring the efficient and orderly allocation of the Reserve to domestic markets in the case of a severe petroleum supply disruption has itself been the focus of detailed study.

LIFO inventory rules

Taxpayers are allowed to claim refunds of taxes paid on LIFO inventory profits when those profits result from inventory liquidations during energy emergencies if the inventories are replaced within three years.

III. Explanation of the Bill

Findings and Definitions

The bill includes certain findings by Congress relating to problems likely to occur during oil supply disruptions and states that the purpose of the Act is to grant the President authority during severe oil supply disruptions to recycle Federal tax revenues to U.S. residents and State governors for the purpose of minimizing the adverse effects of such supply disruptions on the nation.

The bill defines a severe petroleum supply disruption to mean a reduction in the volume of oil available on the world oil market which is the cause of a 20-percent increase in oil prices over a 3-month period and which will have a major adverse effect on public health, welfare, safety or the national economy.

Title I--Standby Revenue Recycling Authority

This title of the bill would require the President to submit to Congress a standby plan for recycling of Federal tax revenues to U.S. residents and State governors during a severe petroleum supply disruption. Procedures for congressional approval of the plan and of implementation of the plan are also provided.

Content of standby plan

The standby plan, which the President would be required to submit within 180 days after the bill is enacted, would specify a combination of mechanisms for recycling of revenues. These could include changes in income tax withholding rates, reductions in payroll taxes, additions to social security and supplemental security income payments, and distribution to State governors for use in their States. The formula for distribution of funds among various distribution mechanisms would be designed to give priority to those individuals or regions who are most adversely affected and least capable of absorbing higher oil prices. The plan generally would provide for: (1) economic efficiency, (2) mitigation of extreme

personal hardship, (3) national defense and other essential public services, (4) protection of public health, safety and welfare, (5) prompt recycling of revenues, (6) eligibility for assistance for every U.S. resident, (7) high priority for enforcement of antitrust statutes against anticompetitive practices, and (8) fulfillment of international treaty obligations.

The plan would also include adjustments to the existing crude oil windfall profit tax that would eliminate the tax on oil discovered during and after the supply disruption and would increase the tax rate on incremental revenues resulting from the disruption. The adjusted tax would apply to all oil flowing from wells in production prior to the disruption.

Approval of proposed standby plan

In order to be in effect, any plan submitted by the President would have to be approved by both Houses of Congress within 60 days (of continuous session of Congress) after the date on which it was submitted. Procedures are provided for expedited consideration of the approval resolutions. If either House rejects the plan, the President would be required to resubmit a revised plan within 30 days of the rejection.

Implementation of approved standby plan

The President could implement the approved standby plan whenever he determines that a severe petroleum supply disruption exists, and only with the President's request for, and passage by Congress of, a joint resolution which authorizes a specific amount of Federal tax revenues to be recycled. Expedited procedures are provided for the consideration of the joint resolution. In addition to the President, either House may initiate the necessary joint resolution. If the President vetos the measure so initiated, the Congress could attempt to override the veto in the usual manner. Regardless of the revenue figure specified in the joint resolution, the President could not recycle revenues in excess of the amount of incremental revenues collected during, and as a primary result of, the severe petroleum supply disruption.

Reimbursement to States

The President could reimburse any State for expenses incurred in preparation for, or execution of, responsibilities under the bill delegated to it by the President.

Expiration

The provisions of this title would expire on the date of the expiration of the crude oil windfall profit tax. This tax expires thirty-three months after the later of December 31, 1987, or when

cumulative net revenues raised by the tax reach $227.3 billion, but the expiration date is no later than 33 months after December 31, 1990.

Title II--Report on Use of the Strategic Petroleum Reserve

Section 201 of the bill would direct the President to submit a report to Congress describing the benefits and detriments of a free market method of crude oil allocation in an oil supply disruption. The purpose of such allocation method would be to assure that crude oil refiners particularly affected by such a disruption would have access to crude oil from the Strategic Petroleum Reserve.

The report would reach a conclusion with respect to whether or not such an allocation procedure should be undertaken in the case of a severe petroleum supply disruption in lieu of a standby crude oil allocation program. It would also examine the particular methods of competitive sales possible, and would establish criteria for determining whether or not a refiner is a "particularly affected" refiner. In so doing the report would consider the effects of that refiner's production on the national and regional economies and would reach conclusions on whether or not any particular group of petroleum consumers should be preferred over others. The report would consider the amounts of crude oil to be released from the Strategic Petroleum Reserve in any given set of facts and the amount of crude oil required to be retained in the reserve. It would, in establishing these volumes, consider current and probable future volumes of crude oil held in the Strategic Petroleum Reserve.

If the report required an amendment to the Strategic Petroleum Reserve Plan in order to make the plan workable, then the bill directs the President to submit tc Congress an amendment or amendments to the Strategic Petroleum Reserve Plan proposing such changes within six months of its enactment.

Title III--Other Investigations and Reports

Section 301 of the bill requires that the President submit to Congress, within six months after the date of enactment of the bill, a full report on the issue of whether or not the use of tax incentives to encourage private oil stockpile drawdowns during an oil supply disruption and to encourage increased private oil stockpiling is advisable. The President would be directed to include in his report a detailed discussion of the alternative means of reducing the tax liability of persons drawing down private oil reserves during an oil supply disruption and of increasing, through tax incentives, private-sector oil storage capacity and actual private-sector oil reserves. The report would address, for example, the use of tax credits or deductions based on per barrel usage or additional storage capacity. The report would also discuss means of establishing total oil reserve drawdowns, or total additional oil reserve storage capacity.

The President would also be directed to report to the Congress on the means which have been or may be undertaken to coordinate oil stockpiling and usage by, among and between our allies and trading partners.

Senator WALLOP. My apologies for arriving late. The hearing will come to order. I had a breakfast meeting which didn't get over quite as quickly as it was supposed to. I haven't seen you in a day or two. It is nice to see you.

The purpose of this hearing today is to invite public comment on S. 1354, the Emergency Preparedness Act of 1981, introduced by my colleague on this subcommittee, Senator Bradley, with Senator Percy of Illinois.

The bill generally provides that in the case of a severe oil supply disruption, that the marketplace would be relied upon to allocate scarce supplies and products. And that additional revenue in the form of increased windfall profit taxes generated by higher oil prices would be recycled into the economy to mitigate the effect of those increased prices.

This approach represents some creative thinking in an area that is vital to this country's welfare. But as to the recent actions of the Energy Committee and the Senate would indicate that there are many questions that must be answered before such an approach could be adopted as the cornerstone of this Nation's policy on such a critical issue as emergency preparedness.

I suspect that you will find no one in the Senate who has more faith in the free market to properly allocate scarce resources than myself. Realistically, the forces which would require the imposition of the plan called for in Senator Bradley's bill would not be free market forces but rather political forces which the free market may or may not be able to anticipate.

The question is not whether the free market will respond to these forces—because eventually I believe it will—but rather will it respond in time to avoid irreparable damage to such industries as agriculture, where crops ready to harvest may not wait until the free market has provided the necessary fuel to bring those crops in.

There are other questions which I also think need to be addressed during the course of this hearing. Most of these questions are not new but for those who did not attend the Energy Committee's deliberations on this legislation or missed the Senate's consideration of the bill, I think they bear repeating.

One of the stated goals of this legislation is to recycle Federal revenues generated by the windfall and profits tax on presumably higher oil prices back to the American taxpayer to assist in coping with those higher prices.

Now, all of us would be affected one way or another by those higher prices. Some of us would be more adversely affected than others. Under this bill, for example, would the person who had to drive 20 miles to work have any preference over the person who has but a few blocks? Would a couple that has no children and earn $30,000 a year be treated the same as a couple who makes that same amount but has three children?

The answers to these questions depend upon your objective. Are we trying to treat all of those affected by the higher prices by trying to cushion the blow in an equitable manner, or are we just seeking to keep the economy moving by injecting more money? Can we or should we seek to accomplish both at the same time?

Once these objectives are defined then the question that comes is: How do we best distribute additional Federal revenue? Do we

accomplish our goal by augmenting social security checks to compensate for higher prices and at the same time reduce the amount of Federal withholding, as is called for in Senator Bradley's legislation, or should we consider a reduction of sales taxes or gasoline excise taxes?

All these questions must be answered. And is evidenced by our recent debates on this issue, none of these answers will come easy. There are further questions as to how this income distribution is best accomplished without costing the American taxpayer even more.

The cost of implementing such a program on the Federal level, the business level, and the individual level, must be examined.

And, finally, if we do succeed in redistributing this additional revenue to compensate for the inevitably higher prices, is there any assurance that there will be fuel supplies to purchase with those additional dollars?

The legislation also highlights broader policy issues. While the bill provides that increased windfall profits taxes would be recycled, one has to wonder were it not for the windfall profits tax whether billions of additional dollars would have been devoted to the search for new domestic resources, which would significantly reduce our need for imported oil—and ultimately the need for this plan or our present emergency preparedness plan.

You cannot help but notice that Senator Bradley's bill provides that in the case of a severe supply disruption, there would be no windfall profits tax on newly discovered oil. And that policy is a good one and one that I fully support. But I do not think that it should have to wait to be implemented until it is too late to be of any great consequence for our domestic energy suppliers.

In conclusion, I commend Senator Bradley for the hard work that he has obviously put in this proposal. And congratulate him for the leadership he has displayed in addressing this issue in the Senate Energy Committee, on the Senate floor and now in the Finance Committee.

There are no easy answers. And clearly there is no perfect solution. I think significant parts of Senator Bradley's bill have merits. And I am looking forward to some constructive dialog during the course of this hearing.

Mr. BRADLEY. Mr. Chairman, I want to take this opportunity to thank you for scheduling and conducting this hearing. I know you have had other duties. And I appreciate the opportunity now to come before the committee with this bill.

Some may ask why the Finance Committee should be taking up this issue, emergency preparedness, especially in light of the fact that the Energy Committee recently reported out and the full Senate passed an emergency preparedness bill that reauthorizes oil price controls and Government allocations.

I think the answer to that is twofold. First, the strongest argument against my market and recycling approach was that we haven't held hearings on the revenue recycling component of the bill. Several Senators expressed strong interest in this alternative to price controls, but were hesitant to vote for such a new and untried approach. This hearing today will provide us with some of the answers that my colleagues had asked about.

The second reason for these hearings is that the price control strategy that was adopted by the Energy Committee and the Senate and by Representative Sharp in H.R. 4700 is not yet law. The full House has not yet acted and the President has not signed it. There is considerable doubt that the President, who within a week of assuming office abolished price controls on oil, would sign a bill reauthorizing those same controls. I, for one, would urge him not to.

If the President does believe that markets work and vetoes the price control legislation, the Senate and House will return to the question of emergency preparedness. When this happens, this hearing, I hope, will prove extremely useful.

Mr. Chairman, as you know, Senator Percy and I introduced the S. 1354 last summer. It was jointly referred to the Energy and Finance Committees. Title I of the bill deals with the rapid recycling of the large revenues that will accrue to the Government under existing tax laws, if price controls on crude oil are not reimposed. These revenues would be returned to the economy through an emergency tax cut, drafted at the outset of the supply disruption and through existing income-maintenance programs, and emergency block grants to the States.

Block grants would be used to maintain State and local services such as police, fire, health, mass transit. And it would enable the States to assist particularly distressed individuals or businesses in each State. Tax cut and emergency block grant legislation would be fashioned by the President and would be submitted to the Congress at the outset of a supply disruption.

Just as normal tax legislation must have the approval of both House and Senate, these emergency tax cuts and block grants must be passed by both houses following the expedited procedures and signed by the President.

Mr. Chairman, I want you and the witnesses to know that I am not wedded to any specific feature of this bill. If anyone has a good argument for modifying the substance or procedures outlined in this version, I am ready and eager to listen. Indeed, since introducing S. 1354 last June, I have already made several changes, changes that appear in the amendment that I offered on the floor last month.

In conclusion, Mr. Chairman, I appreciate your scheduling the hearing. And I think the witnessses have a great deal to add to the exploration of the substance of this bill. And I hope that throughout these hearings, we would keep in mind what the real question is. And that is, is the recycling approach more or less efficient than price controls and allocations, more or less equitable than price controls and allocations, more or less feasible than price controls or allocations?

Senator WALLOP. Thank you very much, Senator Bradley.

The first witness is Mr. Emil Sunley. Mr. Sunley, it is a pleasure to welcome you back to the committeee.

TESTIMONY OF EMIL M. SUNLEY, DIRECTOR OF TAX ANALYSIS, DELOITTE HASKINS & SELLS

Mr. SUNLEY. Thank you, Mr. Chairman. It's a pleasure to be once again before this committee. I should say at the outset, though, that I have noticed that those who used to be on the left have sort of moved to the right, and those on the right have moved to the left. [Laughter.]

The symbolism of that is not lost on me.

I am most pleased to be here today to testify on the Emergency Preparedness Act of 1981. It relies on the market approach, as you know, for adjusting to major oil supply disruption. Energy prices would be permitted to rise to insure efficiency in energy consumption and production. The act recognizes, however, that no emergency program will be able to avoid entirely the market disruptions and personal hardships that will accompany a petroleum supply disruption. But some of these adverse effects can be mitigated if Federal tax revenues are recycled; that is, returned to the economy through tax reductions and grants to the States.

For example, a major overseas supply disruption will result in higher oil prices for domestic producers, increasing the amount of excise and income taxes paid by that industry by more than the reduction in income taxes paid by other industries which have had a reduction in their income. This net tax increase will have an adverse fiscal drag on the economy, and recycling can offset this drag.

The approach of S. 1354 deserves careful study. Standby controls and allocation of oil supplies, the major alternative, may result in less inflation and lower unemployment than relying on the market solution. Available fuel supplies, however, would be used less efficiently and controls deter adjustments in the consumption and supply of energy that need to take place. Moreover, the processes of decontrolling oil and natural gas or implementing a gasoline coupon rationing system are painful ones with their own inefficiencies.

S. 1354 would require the President to submit to Congress a standby plan that would, if implemented, permit the President to recycle Federal revenues as soon as practicable after the President determines the existence of a severe petroleum supply disruption. This standby authority would be granted to the President since it is recognized that the tax legislative process cannot be used to raise or lower taxes quickly. In contrast, withholding can be adjusted fairly rapidly, but even so a withholding change takes 30 to 45 days to implement at the company level.

Tax experts have long suggested that the President be given some authority at least to temporarily reduce individual income taxes. Both Presidents Kennedy and Johnson made recommendations to Congress, but these proposals attracted little congressional support.

In considering a proposal to give the President standby authority, the following issues should be addressed.

First, a track record for fine tuning the economy by tax changes is not a very attractive one. For example, the excise tax cuts in 1965 became effective just as the buildup for Vietnam began. Investment credit was repealed in 1969 just in time for the 1970 re-

cession. And President Ford urged a surtax in 1974 just as the economy went into a major recession. Nevertheless, the fiscal drag, sometimes referred to as the oil drag, resulting from a severe supply disruption should be offset by tax reductions and other measures.

Second, temporary income tax cuts probably have significantly less impact than permanent tax changes.

Third, reductions in payroll taxes would require a replacement of the trust fund revenues given the precarious condition of these funds.

Fourth, if increased incentives for newly discovered oil are needed, they are needed now, not after the next severe supply disruption.

And, fifth, changes in taxes cannot reach many of the very poor who may be disadvantaged by energy price increases. And the other recycling measures contemplated in S. 1354 would be needed.

S. 1354 would require the President to submit a report on alternative means of reducing the tax liability on persons who draw down oil reserves during an oil supply disruption and providing tax or other incentives for private oil storage.

In a more perfect world the threat of severe supply disruptions provides the appropriate incentives for private firms to hold larger inventories. Firms, however, may be reluctant to do this if they believe that when a severe supply disruption occurs their supplies will be allocated or their profits from holding inventories will be subject to a special windfall profits tax. Tax or other incentives could offset these potential disincentives for firms holding optimal oil supplies. The study required by S. 1354 should include estimates of the magnitude of the disincentives.

It should be noted that the Crude Oil Windfall Profit Tax Act removed a tax disincentive to holding the appropriate level of inventories. The act allows firms in certain narrowly defined circumstances to claim a refund for taxes paid on LIFO inventory profits. Also, the Economic Recovery Tax Act extended the investment tax credit to all facilities used for the storage of petroleum or its primary products.

If additional tax or other incentives for oil storage are desirable, the incentives should probably be directed to the construction of storage facilities. But I would urge this committee to remember that incentives, tax or otherwise, are clearly superior to mandating that firms store certain quantities of oil.

Mr. Chairman, thank you very much.

Senator WALLOP. Thank you, Mr. SUNLEY.

[The prepared statement follows:]

PREPARED STATEMENT OF EMIL M. SUNLEY

SUMMARY

(1) S. 1354 relies on a market approach to adjust to a severe supply disruption. It is superior to standby controls and allocation of oil supplies.

(2) The recycling of Federal revenues through tax reductions and other mechanisms can offset the fiscal drag resulting from a supply disruption.

(3) If addition tax or other incentives for oil storage are needed, they should be directed to the construction of storage facilities.

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My name is Emil M. Sunley. I am Director of Tax Analysis at Deloitte Haskins & Sells. I am most pleased to appear before you today to testify on S. 1354, The Emergency Preparedness Act of 1981.

S. 1354 relies on a market approach for adjusting to a major oil supply disruption. Energy prices would be permitted to rise to insure efficiency in energy consumption and production. S. 1354 recognizes, however, that no emergency program will be able to avoid entirely the market disruptions and personal hardships that will accompany a petroleum supply disruption. But some of the adverse effects can be mitigated if Federal tax revenues are recycled; that is, returned to the economy through tax reductions and grants to states. For example, a major overseas supply disruption will result in higher oil prices for domestic producers increasing the amount of excise and income taxes paid by this industry by more than the reduction in income taxes paid by other industries where incomes will have fallen. This net tax increase will have an adverse fiscal drag on the economy. Recycling can offset this drag.

The approach of S. 1354 deserves careful study. Standby controls and allocation of oil supplies, the major alternative to S. 1354, may result in less inflation and lower unemployment than relying on market solution. Available fuel supplies, however, would be used less efficiently since controls deter adjustments in the consumption and supply of energy that need to take place. Moreover, the process of decontrolling oil and natural gas is a painful one with its own inefficiencies.

Standby recycling

S. 1354 would require the President to submit to Congress a standby plan that would, if implemented, permit the President to recycle Federal revenues as soon as practicable after the President determines the existence of a severe petroleum supply disruption. One element of the recycling would be change in withholding rates (and presumably changes in income tax liabilities) and reductions in payroll taxes. The President could also adjust the crude oil windfall profits tax, eliminating the tax on new oil discovered after the supply disruption while increasing the tax on existing oil. This standby authority would be granted to the President since it is recognized that the tax legislative process cannot be used to raise or lower taxes quickly. In contrast, withholding can be adjusted fairly quickly, but even so a withholding change takes 30 to 45 days to implement at the company level.

Tax experts have long suggested that the President be given some authority at least to temporarily reduce individual income taxes. Both President Kennedy and Johnson made recommendations to Congress, but these proposals attracted little Congressional support.

In considering a proposal to give the President standby authority, the following issues should be addressed.

(1) The track record for fine tuning the economy by tax changes is not a very attractive one. For example, the excise tax cuts in 1965 became effective as the build-up for Viet Nam accelerated. The investment credit was repealed in 1969 just in time for the 1970 recession. President Ford urged a surtax in 1974 just as the economy went into a major recession. Nevertheless, the fiscal drag resulting from a severe supply disruption should be offset by tax reductions and other measures.

(2) Temporary income tax cuts probably have significantly less impact than permanent tax changes. Withholding changes without changes in tax liabilities would have only a very minimal impact.

(3) Reductions in payroll taxes would require a replacement of the trust fund revenues given the precarious condition of these funds.

(4) If increased incentives for newly discovered oil are needed, they are needed now not after the next severe supply disruption. A major supply disruption would increase the price of oil increasing the incentive to find new oil. But the increased supply following a supply disruption would only become available after three to four years.

(5) Changes in taxes cannot reach many of the very poor who may be disadvantaged by energy price increases. Other recycling measures, as contemplated in S. 1354, would be required.

Oil Storage Tax Incentives

S. 1354 would require the President to submit a report on alternative means of (1) reducing the tax liability on persons who draw down oil reserves during oil supply disruptions and (2) providing tax or other incentives for private oil storage.

In a more perfect world the threat of severe supply disruptions provides the appropriate incentive for private firms to hold larger inventories. Firms, however, may be reluctant to do this if they believe that when a severe supply disruption occurs their supplies will be allocated or their profits from holding inventories will be subject to a special windfall profits tax. Tax or other incentives could offset these poten-

tial disincentives for firms holding optimal oil supplies. The study required by S. 1354 should include estimates of the magnitude of the disincentives.

The Crude Oil Windfall Profit Tax Act removed a tax disincentive to holding the appropriate level of inventories. That Act allows firms, in certain narrowly defined circumstances, to claim a refund for taxes paid on LIFO inventory profits if the firm replaces the inventory within three years. The Economic Recovery Tax extended the investment tax credit to all facilities used for the storage of petroleum or its primary products even if used in connection with wholesale or distribution activities.

If additional tax or other incentives for oil storage are desirable, the incentives should probably be directed to the construction of storage facilities. Firms will then benefit whether or not there is a severe disruption. In contrast, incentives linked to the amount of realized profits confer the greatest benefits if a supply disruption pushes prices up sharply and only small benefits if prices rise slowly. Incentives—tax or otherwise—are clearly superior to mandating that firms store certain quantities of oil.

Senator BRADLEY. Mr. Sunley, I just want to ask a couple of questions. One is, do you agree that no emergency plan would eliminate the cost and pain of a severe disruption? And I suppose by this you mean that whatever happens, we're going to have a disruption and the price skyrockets? And that you are going to lose a very significant part of your national income to foreign producers?

And my question is, is there anything that you see that could be done to stem this enormous outflow of our wealth to the OPEC countries, an outflow that would be accentuated and increased in the wake of disruption?

Mr. SUNLEY. There's both a short-run adjustment problem and a longer run problem. In the long run, terms of trade do turn against you as the international price of oil rises. In a sense, this results in a lower real income for Americans. The question is how do you adjust to that income, how rapidly do you adjust.

Clearly, sharp rises in energy prices do cause disruption in domestic production and consumption. How can you mitigate those problems by artificially holding down the price of energy? Maybe you can mitigate some of the short-term effects by delaying the long-term adjustment.

We went through a period one time, as you may recall, when there were price controls on domestic crude oil production. We had a situation where, at the margin, we were paying $13 to $15 a barrel for imported oil. The average price consumers had to pay for the oil that they used was more like $8. That just gives the wrong incentive. We end up using too much oil. And in the end, we import more oil than we would if consumers had to pay realistic prices.

Senator, it seems to me that we should face realistic prices. And then, in fact, we will reduce the demand for imported oil.

Senator BRADLEY. Well, let's assume that battle is over, and there is decontrol, and there is one price. What I now suggest is that if there is a disruption, the price is going to skyrocket. Because we import significant quantities of oil, we will have a net outflow of national income. And it will have a major economic effect on the economy that will be depressive in nature.

The question is: Can this recycling mechanism mitigate that very serious down turn potential?

Mr. SUNLEY. Yes. We found in the 1973, 1974 period that not only did we have a surge in domestic inflation—in part because of the rise in oil prices and the monetary policy accompanying it—but

at the same time we found unemployment rising rather rapidly—in part because of the adjustment process.

Senator BRADLEY. This is when?

Mr. SUNLEY. In 1973 and 1974. The question is: Could we have mitigated some of the unemployment effects on a more expansionary policy? We are not going to be able to avoid the adjustment in relative prices. It is going to be needed as a result of international——

Senator BRADLEY. Well, this leads to the next question. You have an oil supply disruption and the price goes up. You have a big chunk of your revenue go out. And you provide a recycling mechanism to give people some money that they've lost through the outflow to keep the economy moving.

Now in the 1973, 1974 period that you are talking about, monetary policy played a significant role here in pushing the economy deeper into a recession than it would have to be?

Mr. SUNLEY. Yes.

Senator BRADLEY. So if you had a recycling mechanism in place and there was a disruption and you recycled some tax revenue, what kind of monetary policy do you think would complement this?

Mr. SUNLEY. I believe you should have a slightly expansionary policy to accommodate the adjustment. Unless you believe that all prices are flexible upward and downward and that we can adjust to the sharp increase in oil prices by other prices falling by a like amount, then it seems that you need some expansionary monetary policy to allow that adjustment to take place.

Senator BRADLEY. Which is just the opposite of what was done after the first disruption?

Mr. SUNLEY. That is true.

Senator BRADLEY. We had a big surge of inflation because of the price increase and because of the disruption. And we saw it as inflation and it had to be snuffed out with monetary policy. We put tough monetary policy on it and it pushed us much deeper than we needed to be. Right?

Mr. SUNLEY. Right. In October of 1974, when I was in the Treasury Department, I remember working well through a weekend to develop a surcharge, a tax surcharge, proposal in response at that time.

Senator BRADLEY. Right. Which is the exact opposite response.

Mr. SUNLEY. I think it had 1 day of hearing before the Finance Committee. It was quietly put to bed.

Senator BRADLEY. Let me go on. You have a recycling mechanism that counters the effect of the negative macroeconomic effect—the disruption and the increase in price would have on the economy. You have got to have complementary monetary policy. But you can't have a monetary policy that frustrates what you are trying to achieve with fiscal policy.

Let's assume that we are going to give this emergency tax cut. Do you have any opinions about what it should be? Across the board, income maintenance? And what are the relative trade offs? And also one other question that gets to your experience at the Treasury. You said it would take 30 to 45 days to recycle or to get the money recycled through withholding. Could this period be shortened if the Treasury and the private sector were already pre-

pared with all of their little forms right on the shelf so that as soon as the President said that we are now going to recycle, they could do it? They wouldn't have to start from the beginning?

Two questions. One: Can you cut that time on the withholding recycle? And two: What is the tax cut that you think that would be the best? Across the board or income maintenance or some kind of targeting?

Mr. SUNLEY. I will begin with the question on the time necessary to implement a withholding tax change. Our general experience in legislation before Congress is that once the withholding tables are printed, the companies need at least 30 days. They usually want 45 days. We sometimes cut it a little short. Some companies can make these changes very rapidly, but other companies—it usually takes about 30 days. But that's very rapid in the grand scheme of fiscal policy.

With respect to the type of recycled tax reduction, I think we should look first to individual tax reductions. First, probably the lag between an increase and after-tax income and spending is probably much shorter in the case of individual tax reductions than in the case of a corporate tax reduction or general excise tax reduction.

Nonetheless, we all recognize that income tax reductions will not reach large portions of the population. And so you do need the other aspects of your recycling program to try to reach these people. True, it is not going to be possible to get perfect justice. I think you well recognize that. But I do think you need additional grants to the States to get recycling down through the State level. But that, I'm afraid, is beyond my own expertise.

Senator BRADLEY. The point is, perfect justice doesn't come from price controls.

Mr. SUNLEY. That is quite clear.

Senator WALLOP. Thank you. I am speaking of surcharge. Why windfall profit tax? Doesn't that, again, put us back in a position for foreign oil—is a better business venture than domestic production?

Mr. SUNLEY. I don't believe so, Senator Wallop. I think even with windfall profit tax the amount of revenue that an oil company keeps per dollar of oil revenue from production in the United States is probably higher than if the oil was produced anywhere else in the world.

Senator WALLOP. Yes.

Mr. SUNLEY. There is a supply effect from having the windfall profit tax.

Senator WALLOP. But if one of the targets is to generate a certain amount of American capital in this country and not result in the large outflow of dollars to foreign suppliers and foreign countries, aren't we better off trying to devise, if it is in any way possible, some kind of a surcharge on that first?

In other words, you know, the real profits will be coming from floating storage. I met a fellow the other day whose entire fortune was made by having a couple of shipments at sea when the last description took place. Shouldn't we be trying to get at that first?

Mr. SUNLEY. During consideration of the windfall profit tax before this committee, I think we did tilt the tax more toward lower tax on new production, a higher tax on old production.

Senator WALLOP. Yes, but that's all domestic. I'm talking about profits that are made—the real profits that everyone was citing, and the ones that came up in the newspapers day-by-day-by-day, were the profits primarily of those engaged in the business of marketing foreign oil.

Mr. SUNLEY. Yes.

Senator WALLOP. Especially under the controls. But their domestic profits were minimally increased; their foreign profits were the ones that gave Mobile a 125-percent increase in profits, as well as the others that we read about. And, I guess, that's what I am trying to say. Shouldn't there be some way to get at those before we even contemplate windfall profit tax on domestic production?

Mr. SUNLEY. It's very hard to get at those without raising the price of oil, which may be what we want to do. I mean we could impose an oil import fee, and, in effect, capture some of those profits. Some of that oil import fee would be shifted forward in higher domestic oil prices. But that is an approach that could be considered.

Senator WALLOP. That just seems to me that that is the primary thing that we ought to seek to capture and maintain—the encouragement on domestic production. And I am fascinated by this recommendation of moving you into a profit position on new production. There were some of us that felt that all along that was plainly the way to go.

Senator BRADLEY. And the Finance Committee voted unanimously not to tax new oil.

Senator WALLOP. I know. But there was another half. Let me ask one last question. The social security system is in trouble financially even with interfund borrowing. And many experts expect that by 1983 or 1984 that that system may be unable to pay benefits from within. And, nevertheless, the proposed recycling plan here would both produce social security tax, payroll tax, and increased benefits. Wouldn't this severely aggravate the system's financial position? And more quickly deplete the funds?

Mr. SUNLEY. As I indicated in my statement, Mr. Chairman, I believe you would want to have some replacement of the revenues in the social security trust fund. It may be that the tax you want to cut, so you can reach a broader group of people, is the social security tax. As you well know, you just don't have the revenues in the trust fund. And that does open up a complex set of issues and some infusion of general revenues into the trust fund.

Senator WALLOP. Thank you. Senator Long.

Senator LONG. Why shouldn't we just do whatever it takes to fill up the reserve in the social security fund so we can stand a temporary situation like that? If we had a substantial reserve in the social security fund, we could give a temporary cut to people, and reduce our surplus somewhat. But we could use it to tide us over. Why shouldn't we build up a surplus in times like these in the social security fund so we wouldn't have to worry about this other thing? If we had enough surplus—what's the point of a surplus if it

is not to carry you through an emergency? Can you think of a better use of a surplus than to see you through a tight situation?

Mr. SUNLEY. I agree with you, Senator Long. Economists have long advocated that we should have a larger surplus in the social security system, partly as a way to increase total savings in the economy and to reduce the bias against savings that may be inherent on a pay-as-you-go social security system.

Senator LONG. Now I'm not talking about, you know, the overall savings for the economy. I am just thinking in terms of the fund itself.

Mr. SUNLEY. Yes.

Senator LONG. It seems to me that if you want a long-range program, we ought to have the courage to either cut back on benefits, which we have done some of—and you and I know that back at a time when they had a big surplus in the fund, Congress was oh so generous in voting benefits. I remember a time when people would offer an amendment out there on the floor and I would beg the Senate not to do it because we couldn't afford it. And notwithstanding that, they would go ahead and vote anyway because the man would go down in the well and grab what he first saw and tell them he is running for office this year—please vote for my amendment. And that was about the logic of some of those benefits that were voted back in those days.

We ought to now look at what we can afford, come back on the benefits in some respects and if need be, just move forward those tax increases that are scheduled in the outyears so that the program would be sound. And in doing so, we wouldn't have to do what you are talking about here, about putting a special tax on to take care of ourselves. In an emergency, we would have a little surplus. I mean enough surplus. I'm not speaking for enough surplus to carry us for several years, I am talking about just for a year or two.

Mr. SUNLEY. We ought to try to get back to having a surplus equal to at least 1 year's benefits.

Senator LONG. I think you are right.

Mr. SUNLEY. That used to be considered the lowest limit. And now we are down to a couple of months.

Senator LONG. And, frankly, I think we ought to do that. It looks to me as though one of these days—and you have served and encouraged and had some of these responsibilities and you have had the advice of those who had higher degrees of responsibility than you had. But it seems to me that one of these days we ought to take a look at what the demand is going to be for revenues. And look at the debits that we have. And then put into effect a program that would give us a balanced budget over the period of several years. Maybe not the first years, but give us 3 or 4 years to sort of—now you know, Ronald Reagan promised that and he wasn't doing that. Jimmy Carter promised it 4 years before. It is so easy for anyone running for President to promise that. But it seems to me that it makes enough sense that we ought to do that. If we can do it by economizing, fine. If we can do it by growth of budget, fine. But one of these days we ought to put a program into effect that even if the lap or curve doesn't work that we will still be able to

pay our way. That's our big shortcoming, it seems to me, looking at what our overall situation is at the moment.

Thank you.

Senator WALLOP. Thank you.

Senator DURENBERGER. Thank you. Any other questions?

[No response.]

Senator DURENBERGER. Emil, thank you very much for your testimony. It was good to see you again.

Our witnesses will be a panel consisting of Mr. William W. Hogan, Robert Fry, Glenn Hubbard, the Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, Cambridge, Mass.

Gentlemen, if you would come forward. We have your written statement, which will be made a part of the record. You may summarize it or proceed in whatever appropriate way you feel you would care to.

TESTIMONY OF WILLIAM W. HOGAN, PROFESSOR, KENNEDY SCHOOL OF GOVERNMENT; DIRECTOR OF THE ENERGY AND ENVIRONMENTAL POLICY CENTER

Mr. HOGAN. Thank you, Mr. Chairman. I want to thank the committee and the chairman for this opportunity to testify on S. 1354 and the tax/recycling aspect of emergency preparedness. I am William W. Hogan. I am a professor at the Kennedy School of Government, and director of the Energy and Environmental Policy Center, and a participant in the Harvard energy and security project where we have been looking at various options for emergency preparedness and analyzing the problems associated with oil supply interruptions.

Part of that work has been dealing with the question of price controls, allocations, rationing, tax recycling mechanisms and so forth.

Virtually everyone who has reviewed the economic impacts of the previous two oil supply interruptions has concluded that the market distributes shortages much more effectively than do government allocations. This efficiency benefit does not, however, preempt the logic of a tax recycling system, because of the large macroeconomic costs of large oil supply interruptions, the fiscal drag from increased revenue from oil taxes, and the resulting large changes in the pattern of income distribution, problems which have been discussed already at these hearings and in extensive discussions in the record.

Any recycling system must be built around a number of management, equity, and macroeconomic concerns. A simple rebate would be unfair since most of the funds would be distributed through the income tax or social security systems, but as we have seen, large numbers of the poor are not covered by these systems. A complex system aimed at perfect equity—an idea which is not met by any proposal on the boards for dealing with oil supply interruptions—would bog down and might result in delayed payments with adverse macroeconomic impacts. It will not be easy to optimize all three objectives, and many options that might score well on both

equity and macroeconomic grounds may simply be administratively infeasible.

Within the broad mandate of deciding how to use the fiscal system to alleviate some of the economic problems of oil supply disruptions, we must emphasize a combination of three goals. The first is improving economic efficiency; the second is pursuing macroeconomic stabilization; and the third, presenting regressive shifts in the existing income distribution.

The bulk of analysis to date has focused on the first of these goals. For example, in comparing tax rebate and coupon rationing systems. Only recently have we begun to analyze the macroeconomic connection, which is the subject of research by my colleagues, Glenn Hubbard and Robert Fry, and also has been addressed in other studies that Jim Plummer will be reporting on later today.

My concern this morning is to advance the debate on the income distribution issues by outlining the channels for distributing quickly large amounts of money in an effort to redress the effect of an oil supply interruption. The first step is to design a specific recycling plan that can be subject to scrutiny and compared to other specific plans to see if such systems are feasible.

To this end, I have submitted for your consideration one detailed proposal developed by Jonathan Berman of our group under the title "Rebate Strategies for an Oil Emergency." This is a rather lengthy paper that I provided in advance for the record. And I draw your attention to it.

[The information follows:]

CHAPTER I: BACKGROUND

In recent years the United States has faced an energy problem that in reality comprises two distinct problems. The first of these problems involves the transition from cheap and seemingly unlimited availability of fossil fuels to a situation of dwindling supplies and escalating costs of these fuels. The second problem is the possibility of disruption during this transition because of a marked dependency on unstable sources of supply. These problems require different solution approaches. Nothing can be done to reverse the depletion of fossil fuel reserves. Higher prices reflect more expensive recovery of remaining reserves and act as a cost signal against which alternative sources of energy must compete. This need to reflect the true cost of energy was the major justification behind the decontrol of energy prices.

A supply disruption, however, is by definition a temporary reduction in supply caused by some exogenous factor. Prices during this period do not represent a long-run equilibrium, but reflect temporary, short-run constraints which act to push prices above the long-run equilibrium level. This new price serves to clear the market, but does not reflect the true cost which will ensue once the disruption ends.

In the case of a short-run interruption, the critical issue is the timing and responsiveness of solution mechanisms. The onset of any disruption immediately creates a new environment to which the economy must adjust; the best that any emergency program can accomplish is to minimize the costs of adjustments.

In the past, the policy response during oil supply interruptions has been to ration the reduced supply and to allocate the remaining product at pre-distruption equilibrium prices. Unfortunately, rationing has not fared well in addressing the critical issues of timing and responsiveness.[1] Formal rationing (even if it incorporates proposals to give a market price at the point

of consumption) requires a central authority to decide the level of consumption allowed and the distribution of consumption across different groups. The time involved in making this decision, the speed of implementing the decision, and the accuracy of the decision determine the final cost of rationing as a method of dealing with supply interruptions.

An alternative to rationing is a market-oriented "tax rebate program" for a supply emergency. This study explores a tax rebate mechanism for dealing with the problems of oil supply interruptions. We begin by determining the size of the revenues that the government may want to recycle.

OIL SUPPLY DISRUPTIONS AND WEALTH TRANSFERS

From Figure 1, we can see that the wealth transfer resulting from an oil supply interruption can be broken up into four concepts. In this case Q equals total demand before a disruption, Q' equals total demand after a disruption, and Q_D equals total domestic production. Triangle ABC represents the unrecoverable welfare loss. Rectangle EBCD represents higher prices on imported crude. Rectangle CAQQ' represents the money saved by not buying what has now been cut off. Finally, rectangle $P_W'EDP_W$ represents a transfer from domestic consumers to domestic suppliers of petroleum.

We now consider just how large this transfer can become. The transfer is defined as:

$$T = Q_D(P_W' - P_W)$$

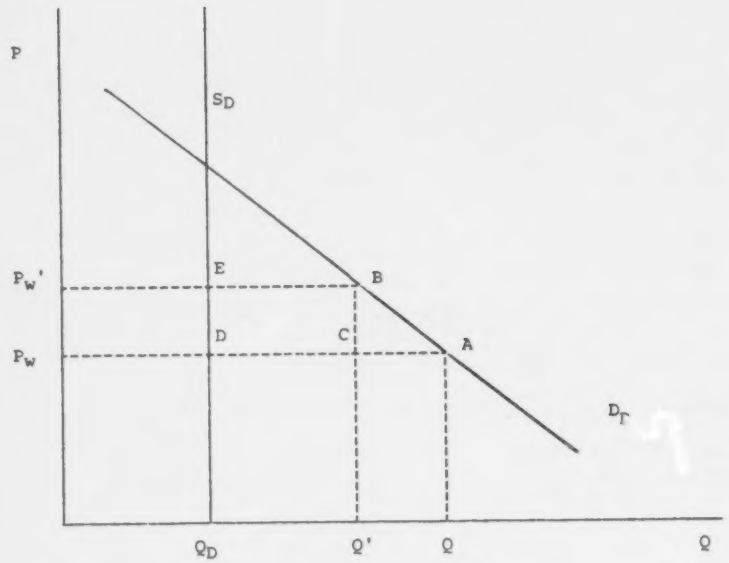
Assuming that Q_D is fixed, the problem becomes one of defining how a shortage affects price. This relationship between price and quantity assuming a constant elasticity of demand is defined as follows:

$$n = (dQ/Q)/(dP/P)$$

This specifies a demand function:

$$Q = cP^n,$$

FIGURE 1: ECONOMICS OF A SUPPLY DISRUPTION



where

$$c = Q_0/P_0^n.$$

Solving for P, one finds

$$P = (Q/Q_0)^{1/n}P_0.$$

By substituing

$$dP = P - P_0,$$

we find:

$$dP = [(1 - dQ/Q)^{1/n} - 1]P_w.$$

(Here, for later convenience, we have treated a disruption loss dQ as a positive number.)

Finally, since $(P_w' - P_w) = dP$, we can substitute into the first equation to define any domestic transfer as:

$$T = Q_D[(1 - dQ/Q)^{1/n} - 1]P_w.$$

SUPPLY INTERRUPTION TRANSFERS

Given appropriate data, it is possible to approximate the size of transfers during a supply interruption. The two exogenous variables representing domestic production (Q_D) and the world price for petroleum (P_w) are defined from (Q4/79) through (Q3/80) data. For the year, domestic production averaged 10.17 MMBD. The world price during this year averaged approximately 26.41 dollars per barrel per year.[2] Total U.S. supply equalled 17.27 MMBD.[3] For now, the elasticity of demand will be allowed to range throughout the inelastic portion from -0.1 to -0.9.

All that remains to be specified in order to determine the level of transfers is the size of the shortage. In order to specify realistic levels, some idea of the world market in which the shortage would occur is necessary. In 1978, total inter-country transfers of petroleum equalled 35.5 MMBD. Of these shipments, the largest single exporter was Saudi Arabia with exports totalling 7.7 MMBD. The Middle East exported the largest amount of oil of any

TABLE 1: U.S. AS A PART OF A WORLD SHORTAGE (1979)

U.S. Consumption 18.43 MMBD
U.S. Net Imports 7.94 MMBD

Effect on Quantity Under Shortage of	Under Percentage Reduction			Under IEA Agreement		
1 million barrels/day	.349	MMBD	Reduction	.349	MMBD	Reduction
3 million barrels/day	1.047	"	"	1.047	"	"
5 million barrels/day	1.744	"	"	1.587	"	"
10 million barrels/day	3.489	"	"	2.886	"	"
20 million barrels/day	6.977	"	"	5.098	"	"

Source: Deese and Nye, Energy and Security (Cambridge: Ballinger Press, 1981).

one region with a total of 19.12 MMBD.[4] Given these concentrations for all contingencies, it seems unlikely that any shortage on world markets will be in excess of 20 MMBD.

Given a world shortage of anywhere up to 20 MMBD, the next question to be answered is how this shortage affects the U.S. Table 1 shows two alternate effects of shortages between 1 and 20 MMBD. The first of these is merely a percentage reduction in demand equal to the percentage reduction in world exports during the shortage. This assumes that each country will find it as easy to reduce demand and that higher prices will induce the same elasticity response across countries. In reality, the market can neither adjust that quickly nor is it allowed to operate without constraint. The fear of panic in world markets has led to the development of an International Energy Agency agreement which has set reductions for the U.S. under various shortages as shown on the second column of Table 1.[5] From both these studies, it seems clear that the possible effect of any world shortage should be a reduction in U.S.-based supply ranging from 0.5 MMBD to 6.0 MMBD.

Using the information presented above, Table 2 presents the possible range of domestic transfers during a supply emergency. Domestic supply, total demand, and price are given. The vertical axis represents the range of elasticity of demand. The horizontal axis represents shortages ranging from 0.5 to 6.0 MMBD. Each result presents both the total transfer and the new price at which equilibrium occurs. The amount of transfer is in billions of dollars annually. Finally, the bottom line of each column presents both imports and total demand at the new equilibrium.

From the chart, the relationship between the size of the transfer and elasticity and disruption size can be clearly seen. As demand becomes more elastic, the transfer decreases proportionately. The same relationship marks the increasing size of the transfer with the increasing size of the disruption. Programs designed to increase elasticity (alternate fuel capability and

TABLE 2: DOMESTIC TRANSFERS YEARLY IN BILLIONS OF DOLLARS

$$T = Q_D[(1 - dQ/Q)^{1/n} - 1]P$$

P_w = 26.41
Q_D = 10.228 MMBD
or 3.73 billion barrels/year

I_o = 7.043
Q = 17.271 MMBD

Disruption in MMBD

n		.500	1.000	2.000	4.000	6.000
-0.1	T	33.64	80.35	238.76	1274.31	6932.7
	P_w'	35.43	47.95	90.42	368.05	1885.03
-0.2	T	15.59	34.23	83.76	269.23	733.7
	P_w'	30.59	35.59	48.87	98.59	223.12
-0.3	T	10.13	21.67	49.96	138.55	310.1
	P_w'	29.13	32.22	39.80	63.55	109.55
-0.4	T	7.51	15.84	35.49	91.82	187.82
	P_w'	28.42	30.66	35.92	51.03	76.76
-0.5	T	5.96	12.48	27.49	68.33	132.80
	P_w'	28.01	29.44	33.78	44.73	62.01
-0.6	T	4.94	10.30	22.43	54.31	102.12
	P_w'	27.74	29.17	32.42	40.97	53.79
-0.7	T	4.22	8.76	18.94	45.02	82.74
	P_w'	27.54	28.76	31.49	38.48	48.59
-0.8	T	3.68	7.63	16.38	38.42	69.44
	P_w'	27.40	28.45	30.80	36.71	45.03
-0.9	T	3.27	6.75	14.44	33.50	59.77
	P_w'	27.29	28.22	30.28	35.39	42.43
Q'		16.771	16.271	15.271	13.271	11.271
I'		6.725	6.225	5.225	3.225	1.225

Source: See text for an explanation of the calculations.

switching), or designed to mitigate the size of the disruption (strategic petroleum reserve) represent a movement towards the lower left corner of the chart. For example, a program which adds 1 million barrels of oil a day to US supply during a 2 million barrel per day disruption, given elasticity of -0.3, keeps the price of oil at 32.22 rather than 39.80 dollars per barrel, thus avoiding a domestic transfer of 28.29 billion dollars annually.

In addition to this transfer from consumer to producer already identified, any disruption also creates a possible change in net payments to oil exporters. This amount can be identified as the net difference between two of the transfers described in Figure 1. This loss equals the higher price paid for crude oil (rectangle EBCD) minus the amount not spent on cut off oil (rectangle CAQQ'). In other terms, this amount equals post-disruption imports ($Q'-Q_D$) times the increase in price caused by the disruption ($P_w' - P_w$) minus consumption given up due to the disruption ($Q - Q'$) times the pre-disruption price P_w.

Mathematically, this loss can be described:

$$W = (Q' - Q_D)\ (P_w' - P_w) - P_w(Q - Q')$$

which can be restated using equation 7 as

$$W = (I_D - dQ)[(1 - dQ/Q)^{1/n} - 1]P_w - P_w(dQ)$$

Table 3 presents the range of wealth losses caused in a disruption. Like Table 2, the vertical axis represents possible elasticity of demand, while the horizontal axis presents several possible supply disruptions.

To determine the range of transfers any program must address, we must determine the actual demand elasticity present in the U.S. market. Estimates of U.S. demand elasticities point to the very inelastic portion of demand as describing short-run domestic consumption responses. Many studies have been undertaken to pinpoint the elasticity of demand because of its importance in energy policy considerations. Estimates of short-term (one year) elasticities range from -0.05 to -0.25.[6] This being the case, only the first two lines of

TABLE 3: ADDITIONAL COST TO IMPORTERS YEARLY IN BILLIONS OF DOLLARS

$$W = (I_0 - dQ)[(1 - dQ/Q)^{1/n} - 1]P - P(dQ)$$

I_0 = 7.043
Q^0 = 17.271 MMBD

P_w = 26.41

Disruption in MMBD

n	.500	1.000	2.000	4.000	6.000
-0.1 :W	16.72	37.75	98.50	340.66	650.30
-0.2 :W	5.17	10.56	22.05	41.56	17.10
-0.3 :W	1.67	3.14	5.36	2.67	-26.16
-0.4 :W	-0.02	-0.38	-1.78	-11.23	-38.65
-0.5 :W	-1.00	-2.97	-5.72	-18.22	-44.27
-0.6 :W	-1.64	-3.92	-8.22	-22.40	-47.41
-0.7 :W	-2.12	-4.47	-9.93	-25.16	-49.39
-0.8 :W	-2.45	-5.15	-11.20	-27.13	-50.75
-0.9 :W	-2.72	-5.66	-12.16	-28.59	-51.73

Source: See text for a description of the calculations.

Tables 2 and 3 describe the most likely outcome for supply disruptions.

Though this elasticity of demand is not fixed and may change over time, to continue this study with specific analyses, a best guess elasticity must be employed. For this study, we use a best guess estimate of the elasticity of demand centers around -0.2. In designing an actual program, this is the estimate which will be used to test its effectiveness. Table 4 presents the wealth and domestic transfers for an elasticity of -0.2 as a percentage of gross national product. The foreign wealth transfer grows to a peak of 1.7 percent of GNP at a disruption of 4.49 MMBD, while domestic transfers grow continuously larger for larger disruptions and reach nearly a third of GNP at a 6.0 MMBD disruption. It is this latter transfer from consumer to producer that the government will be called upon to redress. The effectiveness of various programs geared to this problem must thus be explored.

RATIONING VS. REBATES -- GOVERNMENT OPTIONS

Before proceeding to specific rebate programs for the supply disruptions modelled above, it is helpful to briefly present a comparison between the functioning of a rebate program and the functioning of a rationing program. These two types of programs must be compared because they represent the two options which the government faces in dealing with those problems of a supply disruption discussed above.

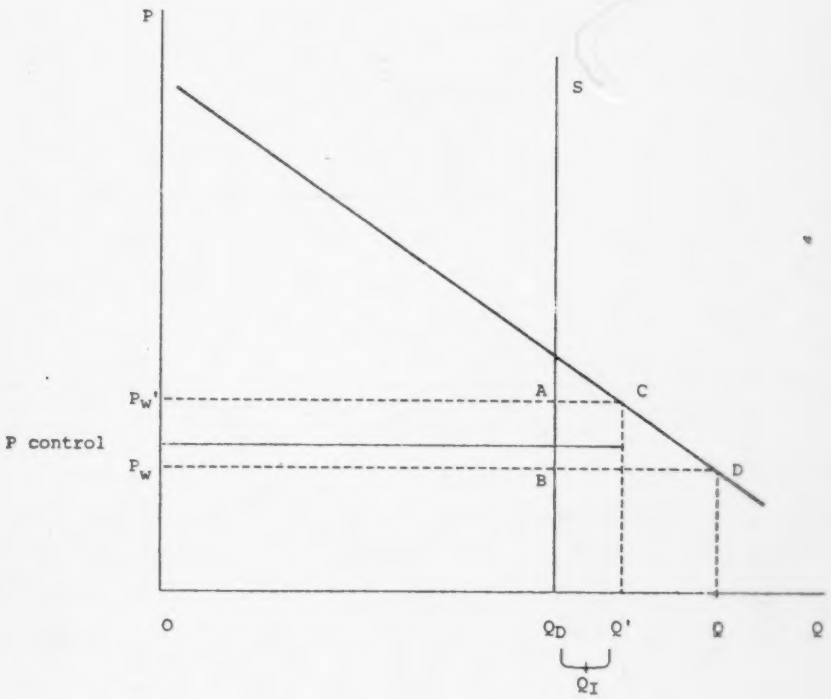
Figure 2 presents the domestic market and its response to a supply disruption. As quantity falls from Q to Q', price rises from P_W to P_W' in an unconstrained market. Domestic production Q_D does not rise in response to this short-run disruption. This means the shaded area $P_W'ABP_W$ represents transfers to domestic producers caused by the shortage. It is this transfer, which as shown above can range from $10 to $750 billion, that both the rationing program and the tax rebate program try to prevent. Each tries to achieve this goal, however, in a different way.

TABLE 4: BEST GUESS ESTIMATES OF EFFECTS OF OIL DISRUPTIONS

Disruption (mm barrels day)	Domestic Transfers (pct. of GNP)	Wealth Loss (pct. of GNP)
0.500	0.6	0.2
1.000	1.4	0.4
2.000	3.4	0.9
4.000	10.8	1.7
6.000	29.8	0.7

Source: See text for a description of the calculations.

FIGURE 2: ECONOMICS OF A RATION PROGRAM



The rationing program prevents this transfer by controlling domestic price. This price control is accomplished by issuing coupons for the right to buy the available gas Q'. Also, because the entitlement program causes imports to be bought at the average cost of all oil, retail price controls are needed to prevent what would have been a transfer from paying for increased imports and raising average costs across the board. With this all set, the coupons obtain a value because at the price $P_{control}$ demand will exceed supply. A white market will allow those who want to buy and sell coupons at what would have been an equilibrium price, thus allowing the market to clear and insuring efficiency as everyone makes the decision at the marginal value of the coupon plus the price of gas.

Figure 2 shows the way in which these two programs follow different tracks to the same outcome. Under rationing, coupons are printed to allocate the shortage amount Q' to consumers. Price is set to allow producers to cover the higher cost of imported crude, but not allow any additional profits on domestic crude. This price ceiling can be defined as:

$$P_c = (P_w Q_D + P_w' I')/(I' + Q_D) \quad ,$$

or in other words:

$$P_c = (P_w Q_D + [(1-dQ/Q)^{1/n} P_0 (I_0 - dQ)])/(I_0 - dQ + Q_D).$$

In simple terms, this means that the foreign wealth transfers alone are incorporated into the domestic price. In Figure 2, this price can be seen as $P_{control}$. Given the domestic demand shown, however, desired demand at $P_{control}$ will exceed the number of coupons issued. Ideally, coupons thus obtain a value equal to the difference between P_w' and $P_{control}$ needed to equilibrate supply and demand. In this way, consumers who must present a coupon and money when buying gasoline will make decisions at the world price, but no transfer of consumer surplus will accrue to the domestic producers.

A tax rebate scheme works in the opposite way. It allows the total domestic transfer shown in Table 2 to be captured as price is allowed to rise

freely from P_w to P_w'. This transfer is then removed by taxing these profits and returning them to the consumers. In a theoretical sense, however, the net goal is exactly the same.

The best way to understand the goal of these two approaches is to view the desired outcome from the point of view of the individual consumer. In these terms, the goal is an attempt to create a substitution effect in demand from oil to other goods.

In evaluating any program, the effect on any individual can be determined through answering the following questions:

1) What is the consumption of the individual before the disruption?
2) What is the effect on prices caused by the disruption (including the value of ration coupons)?
3) What is the consumption of the individual after the disruption?
4) What is the value of the benefits (ration coupons or cash rebate) that accrue to the individual under the proposed program?

Since both tax rebate and rationing schemes pursue the same goal, the question arises as to whether the programs are in fact interchangeable. Giving money in cash or giving a marketable right to the same amount of gasoline has no effect on the outcome. In practice, the effectiveness of these programs can vary enormously. The problem with putting either program into practice is that constraints of time, feasibility, comprehensibility and adaptability intrude. Each program, though it strives for the same goal, is really a program involving three separate aspects of the problem. These three areas are:

1) achieving an efficient outcome;
2) distributing the transfer to society; and
3) collecting the transfer from the producers.

Judging the two programs vis-a-vis the last two areas will involve detailed study of how different groups are affected, i.e., to see who wins and who loses. The remainder of this study will investigate how a rebate program

can best be employed and then will compare its outcomes with those of a rationing system.

SUMMARY

This chapter has attempted to reveal the environment in which any energy emergency plan must operate. Models and related equations have been developed which will make determining the outcome from any proposed plan possible to predict and study. Finally, a comparison on the purely technical nature of rebate and rationing approaches to this problem has been undertaken. In all, an attempt has been made to show that a rebate mechanism should be compared in its effectiveness to a rationing program.

Unfortunately, though a stand-by rationing plan exists, few specific plans of tax rebates have been developed. Further comparison between rationing and rebates can be improved by an elaboration of the requirements for recycling. This chapter laid the foundation for such a study. The economics of the problem have been presented. The potential range of the problem has been determined. The two different approaches of dealing with this problem have been described. The rest of this study will attempt to develop a set of specific, practical rebate mechanisms and compare these with the gasoline rationing plan which represents its chief rival. The four questions which determine the effectiveness of these programs will be answered by looking at the characteristics of the numbers of the demand side of the petroleum market in detail, then studying the post-disruption prices, consumption, and benefits faced by each under a proposed rationing and rebate plan.

CHAPTER II: DESIGNING A REBATE PROGRAM

Given that it is desirable to recycle much of the additional money spent during a disruption back to oil-consuming groups, designing a workable rebate program is a complex task. Rather than starting with the creation of an entire new system, it is easier to first look at a rebate program operated through existing government programs.

While the income transfers inherent in a large oil supply interruption can range to hundreds of billions of dollars, the federal fiscal system is accustomed to handling figures of such magnitude. Even more important than this revenue-collecting ability is the fact that the federal government has experience in operating large-scale income transfer programs (such as Social Security, Unemployment Insurance, Public Assistance, etc.).

Existing government channels could be used as a rebate conduit either through increasing payments to program recipients or through reducing tax collections from individuals. Both sides of the fiscal system can be used with the appropriate timing--weekly withholding of workers' taxes and monthly payments of benefits imply that resulting changes in income can be felt quickly.

The vast majority of households in the United States are covered by the fiscal system, i.e., they pay taxes and/or receive benefits. The interesting question is not whether the income of most Americans can be touched through a recycling program, but whether such a program can be constructed to distribute the burden of the disruption across the direct petroleum consumption patterns of different groups.

In analyzing the effectiveness of this proposed plan, the population is divided into four income groups. These groups, as defined in fourth quarter 1979 dollars, are the poor (20 percent of the population with income under $7500 annually), the lower middle class (40 percent of the population with income between $7500 and $21,000), the upper middle class (20 percent of the population

with income between $21,000 and $30,000), and the well off (20 percent of the population with income greater than $30,000).

Table 5 describes the distribution of sources of income in the population. The single most prevalent characteristic of household income is earnings. A total of 66.6 of the 82.4 million households and unrelated individuals, or roughly 81.0 percent of the total population, earn part of their income. By law, these people are required to file federal income tax returns. At the same time, 15.7 million households and individuals, or 19.0 percent of the population, rely solely on sources other than income. Many of these--such as pensions, rents or other property income--are taxable; however, a large part of these are government transfer programs.

The multiplicity of income sources for a high proportion of the population creates two opposite but equally important problems a rebate program must address. The first of these is duplication; where a program set up to incorporate the total population gives multiple coverage to a significant portion of the population. The other problem is nonentitlement; where a program meant to cover everyone only once fails to cover a significant number of those affected.

GOVERNMENT PROGRAMS

Though affecting a significant proportion of the total population, weekly withholding alone suffers from the problem of insufficient coverage. As Table 5 shows, 15.7 million families had no earnings and therefore no weekly withholding. Because of a vast array of social programs, however, many of these people received checks from the government on a regular basis. The largest of the groups which do not earn income yet receive government transfers include the retired, the unemployed, and the needy. The retired comprise the largest block and are part of the Social Security system.[1] The unemployed who have lost jobs receive benefits through various employment insurance programs. The needy who

TABLE 5: SOURCES OF INCOME

Total 82,389,000 Household Groups
(Includes 5 million unrelated individuals living with families)

Families (thousands of households)

Group	Earnings Only	Earnings & Other Income	Other Income Only
Poor	1534	3726	3976
Lower Middle	6141	15337	2681
Upper Middle	2439	10394	237
Well Off	1429	9768	142
TOTAL	11543	39225	7036

Individuals (thousands of individuals)

Group	Earnings Only	Earnings & Other Income	Other Income Only
Poor	1809	3571	7311
Lower Middle	2870	5281	1208
Upper Middle	839	1228	156
Well Off	112	172	28
TOTAL	5630	10252	8703

Combined (thousands)

Group	Total	Earnings Only	Earnings & Other Income	Other Income Only
Poor	22177	3343	7547	11287
Lower Middle	33518	9011	20618	3889
Upper Middle	15293	3278	11622	393
Well Off	11651	1541	994	170
TOTAL		17173	49447	15739

Source: Current Population Reports, Series P-60 Consumer Income.

Various years, adjusted to 1979 dollars using the GNP deflator.

cannot find jobs or have no one able to work receive benefits through numerous programs under the collective heading of welfare.

Choosing the programs which best enable rebates to be targeted in desired amounts to desired groups depends on identifying just how different groups are represented in different programs. Clear differences exist between these different groups. Social security is the major source of income for those people aged 65 and older. Those under 65 years of age rely more heavily on earnings. At the same time, however, all groups rely on more than just earnings for income. Low income families are virtually the only families that rely on government welfare exclusively, and nongovernment income--defined as income from rents, interest, dividends or trusts--is more common as income rises.

Unfortunately, the number of different forms of income in all groups makes implementing a plan difficult. The reason for this problem is that many of these forms of income are not involved in the government-household relationship. There are people who are nonparticipants in the fiscal system--those self-employed in farm or nonfarm areas, people who receive only a pension, or people who receive nongovernment income. These families neither have money withheld from their pay during the year, nor receive government income. However, fully 97.2 percent of the population have some involvement with the system. A plan incorporating all of these fiscal elements thus gives the potential of reaching nearly the entire country rapidly in an emergency.

THE AGED

Table 6 defines income sources of the population over age 65. The largest single source of income for the elderly is Social Security. Nearly every aged household receives Social Security; therefore, differences in this group are measured by all other income sources. Since Social Security is nontaxable, these returns represent sources of income besides Social Security. Fully 48.1 percent of those aged 65 and over have earnings other than Social

TABLE 6: SOURCES OF INCOME
POPULATION OVER 65

Total Aged Households: 16,001,000
Total Aged Households with Working Member: 4,930,000

(numbers of households in thousands)

Total Taxable Income	Total	Wages/ Salaries	Dividends	Pensions	Interest
$ 0- 2000	626.3	196.3	125.5	96.2	424.4
2000- 6000	2781.7	1081.5	840.1	1183.1	2336.9
6000-10000	1864.9	698.8	871.2	967.0	1689.5
10000-14000	1000.1	478.6	479.2	371.5	936.1
14000-18000	564.6	303.0	304.0	356.1	529.9
18000-22000	322.2	161.4	196.2	144.9	322.0
22000-26000	100.5	97.7	42.1	93.9	189.1
26000-30000	168.0	83.8	111.3	60.6	150.0
30,000+	456.0	248.7	380.1	163.9	450.2
TOTAL	7974.6	3349.8	3449.7	3437.2	7028.1
Percent of all over 65	48.1	20.6	21.3	21.5	43.9

Source: IRS Statistics of Income: Individual Income, Tax Returns 1976 Derived from Table 4-1; and Current Population Reports, Series P-60 Consumer Income. The columns are not mutually exclusive.

Security and filed taxes. An additional 6.3 million families or individuals had income other than Social Security, but did not file an income tax return. These included those aged with Social Security and other income, such as pension income, who did not make enough to require filing an income tax return.

The existence of these large sources of income outside the scope of constant interaction between government and aged population complicates a targeted program. The main characteristic which separates poor income aged from higher income aged is income from property in addition to Social Security. It is virtually impossible to have income greater than $7500 annually on Social Security alone. Only when nongovernment income is added, and then only for about half of these recipients, does income rise to higher levels.[2]

Unfortunately, there is no way of determing whether a Social Security check reaches a family with high nongovernment income, some nongovernment income, or no nongovernment income at all. One possible solution presents itself. Since gasoline expenditures may need to be targeted more efficiently and since a large proportion of any gasoline use is for commuting to work, those aged 65 and over with jobs can be considered separately from those over 65 who do not work. Table 6 shows that 3.3 million of the 4.9 million working aged filed tax returns. The remainder probably worked part-time, and in anticipation of not needing to pay any taxes had no withholding and filed no return. The rebate program developed here follows this lead and considers all those over 65 who work as members of the general population under 65 to be reached through changes in withholding. All those over 65 who do not work will be considered as one target group to be reached through an increase in Social Security.

Following this method, one final technical problem regarding rebates to the aged must be addressed, the issue of multiple coverage, both from Social Security and from withholding and Social Security. Though there are 16 million households in the United States aged 65 or older and though nearly 15 million households receive part of their income from Social Security, more than 22

million checks are mailed to recipients each month. The reason for this higher number is twofold; in some households, dependents also receive monthly benefits, and in other households, two people who have both worked enough to earn Social Security will each receive a check. To avoid double payment, these 7.5 million recipients would have to be identified.

The second problem of double coverage occurs when an individual both works and receives Social Security. From federal government data, one can find the total number of the aged who receive Social Security, the total who receive Social Security and other income, the total who receive wage and salary income, and the total who receive wages and salaries along with nongovernment income. Under the program proposed so far, the aged would receive single coverage through either the withholding or Social Security systems. Those recipients who also work would have to be identified and paid through either one or the other of these methods.

Overall, the ability to target the aged is remarkably good. Fully 10.5 million Social Security beneficiaries equalling 66 percent of all aged households would receive a rebate through Social Security. Roughly half of the total monthly Social Security checks mailed by the government would have money added to their total. Of those eliminated from monthly benefit increases, another 4.9 million households receive increases in take-home pay through decreases in weekly withholding. Only 567,000 aged households would fall outside this system. After adjustment and implementation, 96.5 percent of all aged households and individuals are covered efficiently.

THE POPULATION UNDER 65

Having identified the method of rebating money to the aged population of this country, we now turn to the households and individuals under 65 years of age. Only about one quarter of all those under 65 derive their total income solely from wages and salary. The vast majority (39.8%) supplement this income

with nongovernment property income such as interest and dividends, and a sizable percentage (27.0%) add to this Social Security, welfare, alimony, royalties and various other income. In dealing with the first problem, of reaching as much of the population as possible for rebates, however, the use of withholding changes is extremely effective. Fully 60 million households and individuals earn some income from regular wages and salary. A rebate through reduced withholding on this earning covers over 90 percent of the desired population.

Table 7 revealed that 66.6 million household heads and related individuals earned at least part of their income from wages and salary. The total employed labor force in the United States actually comprises 96.9 million individuals. The reasons for this are threefold. For one, the working aged calculated earlier are part of this total. A second reason is the fact that many households contain two working members. The third reason is that a large number of younger people who may live at home as part of a household group are also members of the total working population.

This distribution of income among various members of society creates a surprisingly positive result for any withholding-based rebate program. Barring complete efficiency of scale--as in two can live as cheaply as one--two working people will consume more petroleum than one working person. Any program which equilibrates this disruption across groups will also rebate more to higher consuming two worker families over one worker families within each income group. The reason for this rests on the declining marginal consumption of gasoline at ever higher income levels. The sum of two rebates based on lower wages must always be higher than the rebate based on a single salary equal to the sum of these two other salaries.

As long as a less than proportional increase in rebate accompanies a higher income bracket, this result will be true. Unfortunately, previous calculations for consumption by income group made no distinction for the number of workers in a family. Because two income households are already rewarded by

TABLE 7: TARGETING POPULATION UNDER 65

Total 66,573,000

	(in thousands)	(percent)
Wages and Salary only	16021	24.1
Wages with nongovernment income	26476	39.8
Social Security only	385	0.1
Public Assistance only	1050	1.6
Social Security with nongovernment income	598	0.1
Public Assistance with Social Security	111	*
Nonparticipating	2123	3.2
Wages and Social Security	2438-4256	3.7- 6.4
Wages and other undefined	13714-15532	20.6-23.3
Social Security and other nonwage combinations	0- 1818	0.0- 2.7
Other nonwage combinations only	0- 1818	0.0- 2.7
Total under 65 with wages as part of income	60467	90.8
Total all ages with wages as part of income	65397	

*Less than 0.1 percent

Sources: Current Population Reports: Series P-60 Consumer Income; and Social Security Bulletin

the nature of the system, incorporating their higher consumption into the base figures per income group overestimates payments both to individuals in these households, and to higher income households which include a rebate calculated from two of these overestimated bases.

To devise an adjustment process to correct total consumption, a weighted average is constructed between single worker families and individual and multiple worker families.[3] This method can be defined at any income level as:

$$gas = total/(single + double \times miles),$$

where: gas = gallons used by single worker;

total = total gasoline by income group;

single = single worker in income group;

double = double workers in income group; and

miles = ratio of miles driven by double worker family relative to single worker family.

The major determinant of this calculation rests on the number used for the ratio miles.

One way in which to deal with the bias problem is to allow adjustments to rebates when income tax is paid. This program would be almost exactly the reverse of the present method of paying taxes. Rebates would be paid based on a set formula based on wages, and a record of total payments received similar to total income tax paid will be recorded on the paycheck. When taxes are filed, a table based on total income will tell whether people have received too little. If this is the case, a direct credit against total income tax due will be granted.

In dealing with the population under 65, we find that over 90 percent of this population are wage and salary earners and therefore part of the tax system. Though this is enough to judge that each person will receive some rebate, the exact wage and salary part of income must be determined. This determination of characteristics has been the major focus of this section. As

we shall see, since the rebate program is based upon wages and not total income, each of these groups will be affected differently. For now, though, it is enough to say that these 65.4 million households and individuals receiving withholding reductions join the 10.5 million aged receiving Social Security rebates to conclude the second area of the rebate program development.

NONWAGE EARNERS UNDER 65

Though we have captured 75.9 million households and individuals through these two arms of the rebate program, 5.9 million families and unrelated individuals remain uncovered. One group of people who neither receive Social Security nor receive part of their income from wages are those people on welfare.[4] By far the largest welfare program falls under the Aid to Families with Dependent Children (AFDC) program. As can be seen, 1.0 million families received benefits under AFDC. Other nonwage combinations account for another 1.8 million needy families.

At the same time, Social Security is paid to disabled persons and their families, and to survivors and their families. From Social Security records, a total of 5.4 million families headed by a nonaged individual receive Social Security payments. These include 2.8 million disabled workers and their families, 1.9 million early retirees and their dependents, and 0.6 million survivors of insured workers who have passed away.

Now, 1.1 million of these recipients depend solely on Social Security for their total income. The remaining 4.3 million recipients of Social Security, and the 0.9 million AFDC recipients who do not depend on Social Security receive these benefits but also receive wages for part of their income. In order not to pay these recipients double, these people must be identified. After this identificiation is made, 2.9 million families depending solely on Social Security and welfare will be added to the rebate program.

Finally, 1.7 million families and individuals fall under the nonparticipating qualification in the population less than 65 years old. This represents 2.1 percent of the total population. Mostly, these people are self-employed and do not pay taxes regularly. Many of these are farmers who run their own farms. Gasoline of course is extremely important to many of these people, and though a small percentage, these people should not be passed over. A partial solution involves allowing self-financing of the need. This could use the adjustment mechanism of tax filing; when people pay taxes at the end of the year, those who do not receive Social Security or withholding reductions qualify for a rebate.

If an adjustment mechanism is incorporated for other purposes of this rebate plan, this path probably would be worthwhile. On the other hand, a special program for two percent of the population hardly seems worthwhile. Moreover, even this program would fail for many of the low income (pensions only, minor self-employment, etc.) group who fall under this plan who neither make enough to pay taxes nor finance the additional cost of petroleum products.

For those who cannot be incorporated in any existing program nor be counted on to finance their own higher costs in return for future tax breaks, the only solution is to set aside money for these people. By allowing uncovered people to register for rebates, or better yet by preregistering these people and mailing checks when a shortage is declared, the program can be extended to cover all families and individuals.

One final program must be added which is necessary for the dynamic nature of any shortage. This last program is unemployment compensation. By definition, unemployment compensation applies to people who have had jobs and have lost them. Like the withholding tax, the unemployment insurance program as already run is amenable to a rebate program. Since we want no change in relative eligibility and benefits for those who are employed or unemployed, and since the unemployment program is already based on income before a job loss just

as rebates would be paid, the only need is to add a set rebate on every dollar of unemployment compensation paid.

This being the case, we can define the size of the unemployment compensation arm of the rebate program by using present data. This result occurs because every job loss which increases payments through unemployment compensation simultaneously reduces payments through withholding reductions. The only thing that changes is the relative distribution between these two payments. Since we use present equilibrium data for jobs, however, the appropriate rebate for unemployment is also the present equilibrium number. According to the data gathered from the states, the number of recipients receiving unemployment benefits at the end of 1979 was 2.9 million.

Overall, a four sector rebate program has been defined for returning money in an emergency. Under this program 97.2 percent of the population can be directly and immediately given money. Table 8 presents the areas under which the population is reached. This table represents the method of reaching everyone, plus the process of eliminating double coverage. For these programs where participation alone identifies the recipient, the numbers participating have been defined. For the wage program, the time has been spent identifying the wage characteristics and not merely participation to understand how benefits will be paid.

One last characteristic which is important for any rebate program is the regional adjustment. Since heating oil consumption (a significant portion of total petroleum consumption) is strongly related to climate, this adjustment is necessary. In this study, the effect on the program is shown by regional adjustment.

In all, the rebate program enables different amounts to be sent to different groups based on four distinct characteristics. These distinctions are:

TABLE 8: REBATE PROGRAM

Total Population: 82,389,000

Program	Number (in thousands)	Percentage
Social Security Increase		
Aged	10504	12.7
Under 65	1100	1.3
Wage Withholding Decrease		
Aged	4930	6.0
Under 65	60470	73.4
Welfare Payment Increase[1]		
Under 65	2800	3.4
Unemployment Insurance Increase[2]		
Under 65	2900	3.5
Separately Identified Need		
Aged	567	0.7
Under 65	1700	2.1

Sources: 1. Social Security Administration, Social Security Bulletin
2. Department of Labor, Employment and Training Administration. The unemployed are doubl;e counted in the other categories, but would be covered during only part of the year.
All others from previous tables

1) total household income;

2) number of workers in the household;

3) whether the household worker or workers are retired or not; and

4) the geographic area in which the recipient lives.

This chapter has focussed on showing a mechanism through which rebates can be made and the important characteristics which will allow a determination of the relative size of the rebates. The nominal size of the rebate, however, depends on the size of the disruption, the cost to various groups, and the amount of returns. The next chapter will incorporate the information presented in this chapter and previous chapters to show exactly how well the rebate plan functions in an actual disruption.

CHAPTER III: EFFECTIVENESS OF THE PROGRAM

THE MODEL

In this chapter all the information presented previously will be used to forecast petroleum supply disruptions causing $50 to $400 billion of consumer to producer transfers. In order to accomplish this, the overall market will be modelled to predict overall changes in price and quantity, and the effects of these changes on the individual groups during this disruption will be presented. This information will guide the payments under a rebate strategy which attempts to distribute the burden of the disruption among all these identified groups. Finally, since any program must face a trade-off between the perfect efficiency of identifying each individual consumption pattern and the practicality of identifying broad group characteristics, the proposed rebate plan will be compared with the existing stand-by rationing plan in their effectiveness in dealing with an emergency. The outline of the model is presented below.

Disruption

Using the theory outlined earlier, given a transfer T, the size of any disruption (dQ) will be found from:

$$T = Q_D[(1 - dQ/Q)^{1/n} - 1]P \ .$$

Using this disruption the new equilibrium crude price will be given as:

$$P' = P(1 - dQ/Q)^{1/n} \ .$$

Supply

In order to establish prices for the numerous products of the supply side identified in Chapter 1, we will use the modelled post-disruption price P' to define the price of any product P_p as:

$$P_p = C_p + R_p + M_p + T_p$$

where: C_p = the new cost of crude oil after the disruption;

R_p = cost of refining product p;[1]

M_p = markup of distributors for product p;[2] and

T_p = tax on product p.[3]

In this model it will be assumed that only crude oil prices rise; all other costs are fixed in the short-run time frame of a disruption.

Demand

Demand in this model will be defined for each group as:

$$D' = D_i - (dD/dP)(P' - P) \quad .$$

Here demand is specified as given initially at D_i in each specific subgroup; elasticity is assumed constant across all groups. Thus each group will cut back on consumption depending on the price defined by the forecasted disruption.

Initial Reference Frame

The disruption will be modelled on a base period of the year from the fourth quarter of 1979 through the third quarter of 1980. The elasticity of demand will be taken as -0.2. This will define the relative size of disruption that will create a given transfer. Charging the elasticity, however, only means a different size disruption would cause the same size transfer; the effect on the distribution of cost to different groups changes little as defined. Since the focus is on the amount of money and the ability to rebate it effectively regardless of the disruption size, the use of this elasticity functions mainly to present a single most likely outcome. As shown earlier, one of the advantages of the rebate program, unlike the rationing program, is that it allows the adjustments of benefits in a dynamic market as one of the choices of the program coordinator. Recognizing these dynamics, this program will idealize the comparisons of this chapter based on the comparative statics of the described pre-distruption and the modelled post-disruption equilibria.

Emergency Program Benefits

The methods of dealing with the petroleum supply disruptions modelled are the rebate program defined in Chapter II and the registration-based gasoline rationing program which constitutes the present stand-by emergency program of the government.[4] The size of the recipient pool and the characteristics under which each qualifies are also derived from the distinctions uncovered in that Chapter. These characteristics will determine the size of the benefits paid under the program to each covered group.

THE TRANSFERS

In order to illustrate the functioning of the rebate program, four levels of disruption of increasing severity are examined. These disruptions are defined in terms of the total transfer from consumer to producer. Tables 9 through 12 summarize these transfers as defined by the model outlined above. Disruptions causing $50, $100, $200 and $400 billion of income transfers are modelled separately. This will enable not only an exploration of dealing with a given disruption, but the comparable ease of running the program at higher overall levels of shocks to the system.

The Fifty Billion Dollar Disruption

The first disruption to be dealt with involves a supply cutback severe enough to cause a $50 billion income transfer from petroleum consumers to petroleum producers. Using the assumptions outlined above, Table 9 presents the scenario for this disruption. The transfer is initiated by a reduction in imports of 1.36 million barrels per day. This creates a rise in crude oil price from $26.41 per barrel to $39.82 per barrel. At the same time, the price of heating oil increases from 93.45c per gallon to 125.4c per gallon, and the price of gasoline rises from 105.40c gallon to 147.30c per gallon. This represents a

TABLE 9: $50 BILLION TRANSFER

Disruption: 1.36 MMBD
Price of Crude: $39.82/barrel
Price of Products: (cents per gallon retail)
Number 2 Heating Oil: 125.4c Gasoline: 147.3c
Total consumption as percent of pre-disruption total: 92.1

Gasoline Consumption after Disruption (-65)
(for Household with Cars)

Group	Average Consumption (gal)	Expenditure ($)	Additional Cost ($)	Additional Cost as % of Median Income
Poor	595.8	877.6	131.1	2.9
Lower Middle	1082.4	1594.4	238.2	1.7
Upper Middle	1632.1	2404.1	359.1	1.4
Well Off	1775.4	2615.2	390.6	1.0

Gasoline Consumption after Disruption (+65)
(for Household with Cars)

Poor	307.2	452.5	67.6	1.5
Lower Middle	557.9	821.8	122.7	0.9
Upper Middle	841.5	1239.5	185.1	0.7
Well Off	915.1	1347.9	201.3	0.5

Home Heating Fuel after Disruption (all ages)
(for Homes Heating with Fuel Oil)

Poor	731.3	917.1	175.1	3.9
Lower Middle	714.7	896.2	171.0	1.2
Upper Middle	781.9	980.5	187.1	0.7
Well Off	944.0	1183.8	225.9	0.6

Total Additional Costs (millions of dollars)

Group	Gas (-65) ($)	Gas (+65) ($)	Fuel Oil ($)	Total Additional Direct Costs ($)
Poor	697.1	235.5	604.1	1536.7
Lower Middle	5331.4	636.6	1204.0	7172.0
Upper Middle	4884.8	149.9	648.9	5683.6
Well Off	5992.6	160.6	823.2	6976.4
TOTAL	16905.9	1182.6	3280.2	21368.8

Source: See text for an explanation of calculations.

TABLE 10: $100 BILLION TRANSFER

Disruption: 2.26 MMBD
Price of Crude: $53.22 per barrel
Price of Products: (cents per gallon retail)
Number 2 Heating Oil: 157.3c Gasoline: 179.2c
Total consumption as percent of pre-disruption total: 86.9

Gasoline Consumption after Disruption (-65)
(for Household with Cars)

Group	Average Consumption (gal)	Expenditure ($)	Additional Cost ($)	Additional Cost as % of Median Income
Poor	562.2	1007.5	131.1	2.9
Lower Middle	1021.1	1830.0	473.8	3.4
Upper Middle	1540.0	2759.7	714.7	2.8
Well Off	1675.2	3002.0	777.4	2.0

Gasoline Consumption after Disruption (+65)
(for Household with Cars)

Poor	289.8	519.3	134.4	3.0
Lower Middle	526.4	943.3	244.2	1.9
Upper Middle	794.0	1422.8	368.4	1.4
Well Off	864.4	1549.0	402.4	1.0

Home Heating Fuel after Disruption (all ages)
(for Homes Heating with Fuel Oil)

Poor	690.0	1085.4	343.4	7.7
Lower Middle	674.3	1060.7	335.5	2.4
Upper Middle	737.8	1160.6	367.2	1.4
Well Off	890.7	1401.1	443.2	1.1

Total Additional Costs (millions of dollars)

Group	Gas (-65) ($)	Gas (+65) ($)	Fuel Oil ($)	Total Additional Direct Costs ($)
Poor	1387.7	468.1	1184.7	3040.5
Lower Middle	10604.6	1266.9	2362.3	14233.2
Upper Middle	9722.1	298.4	1273.4	11293.9
Well Off	11926.9	321.1	1615.0	13863.0
TOTAL	33641.1	2354.5	6435.5	42430.6

Source: See text for an explanation of calculations.

TABLE 11: $200 BILLION TRANSFER

Disruption: 3.43 MMBD
Price of Crude: $80.03 per barrel
Price of Products: (cents per gallon retail)
Number 2 Heating Oil: 221.1c Gasoline: 243.0c
Total consumption as percent of pre-disruption total: 80.1

Gasoline Consumption after Disruption (-65)
(for Household with Cars)

Group	Average Consumption (gal)	Expenditure ($)	Additional Cost ($)	Additional Cost as % of Median Income
Poor	518.2	1259.2	512.7	11.5
Lower Middle	941.3	2287.4	931.2	6.7
Upper Middle	1375.3	3342.0	1297.0	5.0
Well Off	1505.5	3658.4	1433.8	3.7

Gasoline Consumption after Disruption (+65)
(for Household with Cars)

Poor	267.1	649.1	264.2	5.9
Lower Middle	485.2	1179.0	479.9	3.4
Upper Middle	731.9	1778.5	724.1	2.8
Well Off	795.9	1934.0	787.4	2.0

Home Heating Fuel after Disruption (all ages)
(for Homes Heating with Fuel Oil)

Poor	636.0	1406.2	664.2	14.9
Lower Middle	621.6	1374.4	649.2	4.7
Upper Middle	680.0	1503.5	710.1	2.7
Well Off	821.0	1815.2	857.3	2.2

Total Additional Costs (millions of dollars)

Group	Gas (-65) ($)	Gas (+65) ($)	Fuel Oil ($)	Total Additional Direct Costs ($)
Poor	2726.0	920.2	2291.5	5937.7
Lower Middle	20842.1	2489.7	4571.0	27902.8
Upper Middle	17643.1	586.5	2462.6	20692.2
Well Off	21997.4	628.3	3124.0	25749.7
TOTAL	63208.6	4624.8	12449.1	80282.5

Source: See text for an explanation of calculations.

TABLE 12: $400 BILLION TRANSFER

Disruption: 4.78 MMBD
Price of Crude: $133.65 per barrel
Price of Products: (cents per gallon retail)
Number 2 Heating Oil: 348.8c Gasoline: 370.7c
Total consumption as percent of pre-disruption total: 72.3

Gasoline Consumption after Disruption (-65)
(for Household with Cars)

Group	Average Consumption (gal)	Expenditure ($)	Additional Cost ($)	Additional Cost as % of Median Income
Poor	467.7	1733.8	987.3	22.1
Lower Middle	849.7	3149.8	1793.6	12.9
Upper Middle	1281.2	4749.4	2704.4	10.4
Well Off	1393.7	5166.4	2941.8	7.5

Gasoline Consumption after Disruption (+65)
(for Household with Cars)

Poor	241.1	893.8	508.9	11.4
Lower Middle	438.0	1623.7	924.6	6.6
Upper Middle	660.6	2448.8	1394.4	5.4
Well Off	718.4	2633.1	1486.5	3.8

Home Heating Fuel after Disruption (all ages)
(for Homes Heating with Fuel Oil)

Poor	574.1	2002.5	1260.5	28.2
Lower Middle	561.0	1956.8	1231.6	8.8
Upper Middle	613.8	2140.9	1347.5	5.2
Well Off	741.1	2585.0	1622.1	4.2

Total Additional Costs (millions of dollars)

Group	Gas (-65) ($)	Gas (+65) ($)	Fuel Oil ($)	Total Additional Direct Costs ($)
Poor	5249.5	1772.5	4348.7	11370.7
Lower Middle	40144.4	4796.8	8671.7	53612.9
Upper Middle	36788.0	1129.5	4673.1	42590.6
Well Off	45133.1	1186.2	5910.9	52230.2
TOTAL	127315.0	8885.0	23604.4	159804.4

Source: See text for an explanation of calculations.

new equilibrium where total consumption after the disruption has fallen to 92.1 percent of the pre-disruption consumption levels.

At this new equilibrium, consumption by the various groups defined earlier is presented in Tables 9 through 12. All groups cut back in their consumption, but pay more for what they consume because prices rise much more than consumption falls. As shown, the direct cost of any disruption is three times as high on poor households than on well off households for gasoline,[5] and over six times as high for poor households consuming heating oil.[6] Overall, a total of $18.1 billion are transferred from consumers of gasoline, $3.3 billion are transferred from consumers of fuel oil, and $28.6 billion are transferred from consumers of all other products.

Given this amount of transfer and the proposed rebate program, the next step is to devise actual amounts of money to be given back under the various arms of the rebate structure. The best way to do this is to explore the rebate for each arm separately.

Social Security

The first rebates to be determined are Social Security increases. As previously calculated, 11.6 million households receive rebates through Social Security. In a $50 billion disruption, as can be seen in Table 9, over-65 households with cars spend between $70 and $200 more on gasoline during a disruption, and over-65 households which heat by oil spend between $175 and $225 more on heating fuel during a disruption on an annual basis.[7]

Recall, though, that there is no way to distinguish the income of households which receive Social Security as their source of income. Because of this limitation, all Social Security recipients must receive the exact same rebate. Since home heating expenditures vary little with income, choosing one amount for this part of the rebate is an acceptable second best solution. In this case, the equivalent of $180 annually is chosen. This guarantees the poor

and lower middle class aged are no worse off than before the disruption, and that the higher income aged spend no more than an additional one percent during a shortage.

Because those over-65 make up the majority of this program, the rebate is based on aged expenditures; but this amount is also sent to those under 65 who rely on Social Security.

In addition, the rebate must be adjusted for the climate where the recipients live. Adjusting to the consumption figures for different regions shown in Table 13 determines that this $180 actually disaggregates into $226 in the northeast, $222 in the northcentral, $114 in the south and $159 in the west for those households heating with oil.[8] The number of recipients in each region, assuming the ratio of working to nonworking aged does not vary, can also be found from Table 13. From these data, it can be determined that there are 2.4 million, 2.6 million, 3.2 million, and 2.3 million Social Security rebate households in the northeast, northcentral, south, and west, respectively.[9]

Along with heating fuel rebates, money must be returned under this program for gasoline consumption. Here, unfortunately, the inability to distinguish between different income groups makes a rebate problematic. The solution chosen here is to make the lower income groups no worse off, and allow the higher income groups to bear the uncovered part of the cost themselves. For the average well off aged person, this uncovered part of the burden amounts to no more than 0.2 percent of total income. Following this type of program, the amount of this aspect of the rebate will equal $120 annually.

Table 13 summarizes the Social Security arm of the rebate scheme. Total rebates range from a low of $234 in the south to a high of $346 in the northeast. As can be seen, added to the regular monthly checks would be an additional $20-$30. Overall, this arm of the program would involve $3.4 billion of rebates.

TABLE 13: REBATE UNDER $50 BILLION DISRUPTION

Social Security Total Rebates 10,504,000 (+65)
1,100,000 (-65)

Region	Number (tousands)	Heating ($)	Gasoline ($)	Total ($)
Northeast	2,657	226	120	346
Northcentral	2,901	222	120	342
South	2,516	114	120	234
West	2,541	159	120	279

Total Rebates (millions of dollars)

Region	Rebate	Total
Northeast	346	919.2
Northcentral	342	992.2
South	234	822.8
West	279	708.9
TOTAL		3,443.1

Monthly Increase in Social Security
($ per household)

Northeast	Northcentral	South	West
28.83	28.50	19.50	23.25

Withholding Decreases

The second part of the rebate program to be explored are decreases in weekly withholdings of wage and salary workers. The rebate amount, though increasing, represents a steadily decreasing percentage of income. In practice, the rebated amount will not be discontinuous depending on membership in one of four distinct groups, but will fill in the income levels between these incomes to create a smooth rebate income relationship. For purposes of studying various groups, however, these four points will be used for averages, and the schedule for middle levels trended from these numbers.

Actual rebates to the various types of households with wage earners will depend on actual wage earnings given this rebate structure. Differences in the wage proportion of income change with the size of the family, the number of workers, and the size of nonwage property income of the family. To determine these levels of benefits, the average characteristics of these various groups are used.

Table 14 summarizes the payments to the different groups under the withholding decrease for the $50 billion disruption given that rebates are scaled such that one income families are no worse off after the disruption. Rebates for this group range from a low of $302 to a high of $553 per person. For the second group, which is households with one worker, the rebates range from $303 to $567. The higher rebates reflect the fact that individuals tend to have more property income not reflected in wage schedules among their earnings.[10] At the same time the aged, with the most nonwage income, find they receive the lowest rebates for a given overall income group. These rebates range from $280 to $480. Finally, households with two workers have rebates running from $440 to $880.[11] This rebate is about 40 percent higher than the rebate to those families with one worker which is greater than the additional miles of the second commuter.[12] Unfortunately, the only way to reduce this amount under the system would be to reduce payments to all. This would,

TABLE 14: REBATE UNDER $50 BILLION DISRUPTION

Individuals

Group	Wage Income (thousands)	Rebate ($)
Poor	4,414	302
Lower Middle	13,288	393
Upper Middle	21,480	445
Well Off	32,607	553

One Worker Families

Poor	4,434	303
Lower Middle	13,156	392
Upper Middle	24,384	505
Well Off	35,439	553

Aged Families

Poor	4,000	280
Lower Middle	8,281	340
Upper Middle	13,626	400
Well Off	21,699	480

Two Worker Families

Group	First Earner Income ($)	First Earner Rebate ($)	Second Earner Income ($)	Second Earner Rebate ($)	Total Rebate ($)
Poor	3,318	250	1,116	190	440
Lower Middle	9,598	350	3,558	250	600
Upper Middle	17,634	430	6,750	330	760
Well Off	24,900	510	10,539	370	880

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however, make individuals and one worker families worse off. As long as these people are totally protected, the levels of rebates to two income families must be as shown.

Withholding decreases, as with Social Security increases, must also be adjusted for region. Table 15 gives the final rebates when this adjustment is put into the system. Once again, the assumption is that the percentage of different subgroups remains constant across regions. For example, rich recipients are assumed not to be more prevalent in the south than in the northeast. With these assumptions, Table 15 presents all the rebates under the withholding decrease system. As can be seen, different rebates are provided depending on total income, geographical location, the number of workers in a family, and the level of nonwage income which separates the various types of single-worker families.

Other Programs

In addition to the withholding decrease, rebates must be made to those households on welfare, unemployment, or uncovered by any of these other programs. Table 16 presents the cost of these other programs. Under welfare, the rebate given equals the rebate for single worker, poor families. The justification for this is that if they do not work, this will cover heating and the smallest consumption of gasoline. At the same time, rebates to the unemployed and uncovered are lump sum payments. This is done because the amount of the rebates will depend on the conditions of the applicant. Since recipients can be of any category, there is no way to estimate the exact cost. An average rebate of $400 is used in this case. These two are lumped together because unemployment offices, already existing on the local level, seem best able to cope with the needs of identifying and processing rebates for both these groups. For purposes of this program, the $2 billion will simply be distributed directly to the states.

TABLE 15a: THE $50 BILLION DISRUPTION

Withholding Decreases

Group	Number (thous)	Rebate ($)	Total Rebate (millions of dollars)
Poor Individuals/Northeast	1,217	346	421.1
Poor Individuals/Northcentral	1,442	342	493.2
Poor Individuals/South	1,737	238	413.4
Poor Individuals/West	960	282	270.7
Lower Middle Individuals/Northeast	1,821	453	792.1
Lower Middle Individuals/Northcentral	2,158	452	975.4
Lower Middle Individuals/South	2,599	331	860.3
Lower Middle Individuals/West	1,436	373	535.6
Upper Middle Individuals/Northeast	218	485	105.9
Upper Middle Individuals/Northcentral	259	482	124.8
Upper Middle Individuals/South	312	386	120.4
Upper Middle Individuals/West	172	426	73.3
Well Off Individuals/Northeast	164	607	99.5
Well Off Individuals/Northcentral	194	603	117.0
Well Off Individuals/South	234	475	111.2
Well Off Individuals/West	129	528	68.1

TABLE 15b: THE $50 BILLION DISRUPTION

Withholding Decreases

Group	Number (thous)	Rebate ($)	Total Rebate (millions of dollars)
Poor 1 Worker Family/Northeast	645	347	223.8
Poor 1 Worker Family/Northcentral	764	343	262.1
Poor 1 Worker Family/South	921	239	220.1
Poor 1 Worker Family/West	509	283	144.0
Lower Middle 1 Worker Family/Northeast	2,155	434	935.3
Lower Middle 1 Worker Fam/Northcentral	2,553	451	1,151.4
Lower Middle 1 Worker Family/South	3,075	330	1,014.8
Lower Middle 1 Worker Family/West	1,699	372	632.0
Upper Middle 1 Worker Family/Northeast	1,466	550	806.3
Upper Middle 1 Worker Fam/Northcentral	1,737	547	950.1
Upper Middle 1 Worker Family/South	2,092	438	916.3
Upper Middle 1 Worker Family/West	1,156	483	558.3
Well Off 1 Worker Family/Northeast	1,041	622	647.5
Well Off 1 Worker Family/Northcentral	1,234	618	762.6
Well Off 1 Worker Family/South	1,486	487	723.7
Well Off 1 Worker Family/West	821	541	441.2

TABLE 15c: THE $50 BILLION DISRUPTION

Withholding Decreases

Group	Number (thous)	Rebate ($)	Total Rebate (millions of dollars)
Poor 2 Worker Families/Northeast	215	503	108.1
Poor 2 Worker Families/Northcentral	255	498	127.0
Poor 2 Worker Families/South	307	348	106.8
Poor 2 Worker Families/West	170	410	69.7
Lower Middle 2 Worker Fam/Northeast	1,437	665	955.6
Lower Middle 2 Worker Fam/Northcentral	1,702	660	1,123.3
Lower Middle 2 Worker Families/South	2,501	505	1,263.0
Lower Middle 2 Worker Families/West	1,133	554	627.7
Upper Middle 2 Worker Fam/Northeast	1,654	829	1,371.2
Upper Middle 2 Worker Fam/Northcentral	1,960	824	1,615.0
Upper Middle 2 Worker Families/South	2,361	660	1,558.3
Upper Middle 2 Worker Families/West	1,304	728	949.3
Well Off 2 Worker Families/Northeast	1,698	967	1,642.0
Well Off 2 Worker Families/Northcentral	2,013	960	1,932.5
Well Off 2 Worker Families/South	2,424	954	1,827.7
Well Off 2 Worker Families/West	1,339	840	1,124.8

TABLE 15d: THE $50 BILLION DISRUPTION

Withholding Decreases

Group	Number (thous)	Rebate ($)	Total Rebate (millions of dollars)
Poor Working Aged/Northeast	235	320	75.2
Poor Working Aged/Northcentral	257	317	81.5
Poor Working Aged/South	311	221	68.7
Poor Working Aged/West	225	261	58.7
Lower Middle Working Aged/Northeast	548	377	206.6
Lower Middle Working Aged/Northcentral	598	374	223.7
Lower Middle Working Aged/South	725	286	207.4
Lower Middle Working Aged/West	524	323	169.3
Upper Middle Working Aged/Northeast	181	436	78.9
Upper Middle Working Aged/Northcentral	198	434	85.9
Upper Middle Working Aged/South	240	347	83.3
Upper Middle Working Aged/West	173	383	66.3
Well Off Working Aged/Northeast	164	527	86.4
Well Off Working Aged/Northcentral	180	524	94.3
Well Off Working Aged/South	218	411	89.6
Well Off Working Aged/West	157	458	71.9

Effectiveness

The efficiency of the program can be measured in two ways--as a complete program and in reaching targeted groups. The middle of Table 16 presents the most basic view of the macro-efficiency of the rebate program. This table has aggregated the rebates of each of the groups identified in Table 15. Altogether, a total of $40 billion is rebated. Compared to the total additional direct costs defined earlier for a $50 billion disruption, the rebate returns $40 billion for $21 billion of direct costs. The reason that the money is available for this rebate is because taxes are collected on the higher prices of both indirect and direct consumption products of petroleum, while rebates are based only on direct costs.

Because of the breadth of this rebate program, overpayments of direct costs have occurred. All the groups identified in this model have been rebated their additional direct petroleum costs, but because the rebate is made to everyone, some people in each category are paid even when they do not pay any higher costs.

The bottom of Table 16 shows how the various groups benefit. The poor are the biggest gainers receiving 76 percent above their actual costs in rebates. In nominal terms, the overpayments range from a low of $3.5 billion to well off households, to a high of $6.4 billion to lower middle income households.

It is important to identify the major gainers of this program. In the case of overpayment, these are the households not involved in the determination of rebate amounts, but who are nevertheless in the universe of rebate recipients. The largest single characteristic of this group are those households not heating by fuel oil.

The remaining overpayments after the heating adjustment come from a variety of causes. For the poor, it arises from the large number of poor aged

TABLE 16: OTHER REBATES

Welfare

Group	Number (thous)	Rebate ($)	Total ($millions)
Northeast	636	$347	$ 220.7
North Central	753	343	258.3
South	907	239	216.8
West	501	283	141.8

Fund for Others

Uncovered	2267	400	906.8
Unemployment	2900	400	1161.0

Total Program

Group	Amount ($millions)	% of Total
Social Security	3443	8.5
Individuals	5582	13.8
1-worker Families	10390	25.7
2-worker Families	16402	40.5
Working Aged	1748	4.3
Welfare	838	2.1
Others	2068	5.1
TOTAL	40471	

Program Effectiveness
Additional Payments by Group ($millions)

Group	Rebated Cost	Actual Costs	Excess Rebate	Percent
Poor	6409	1537	4872	76.0
Lower Middle	13545	7172	6373	47.0
Upper Middle	10081	5684	4397	43.7
Well Off	10436	6976	3460	33.2

Additional Nonheating Payments by Groups ($millions)

Group	Rebated Cost	Heating	Corrected Rebate	Excess Rebate	Percent
Poor	6409	2127	4282	2745	42.8
Lower Middle	13545	4540	9005	1833	13.5
Upper Middle	10081	2352	7729	2045	20.3
Well Off	10436	2280	8156	1180	11.3

receiving Social Security checks based on the lower middle income average, plus the larger number of households without cars receiving money for gasoline. For higher income groups, the excess rebates represent the additional money derived from the system over compensating two income families.

With these overpayments, it might be asked whether the program would be more efficient with some adjustment. The easiest adjustment would be to remove the heating fuel component from the rebate. Since a majority of households do not heat with fuel oil, removing this halves the total overpayment.

The reason that this path is not chosen in this study is because of the different natures of the three types of overpayments. Heating fuel and gasoline overpayments go to those who do not own cars or heat with oil. Payment to two income families are extra payments to those who are already being compensated for higher direct costs. If heating rebates were reduced, the higher income groups would still receive overpayments based on two earners. This money would help cushion the impact of higher heating prices. Lower income families, however, would not have this cushion and would be hardest hit. This 40 percent of the population least able to finance the heating cost would be forced to finance heating costs. Since the money collected from indirect cost will cover heating costs rebates, and since two income families in higher income households receive extra money regardless of this adjustment, it seems reasonable to keep the payments for heating oil which help lower income families.

Besides this purely distributional argument for keeping heating oil rebates, another argument can be made for keeping the payment in a single universal program of rebates rather than attempting to rebate it just to those who heat with oil. Though everyone may not heat with oil, nearly everyone heats. The cost of heating by any source tends to reflect the cost of petroleum. In some cases, such as electric heat, it is because electricity uses petroleum directly in its production. In other cases, such as natural gas, it is because the product serves as a substitute for petroleum in all sectors of

the economy, and any increase in petroleum prices will spur an increase in this other product demand and a subsequent rise in its price. Indeed, since 1973 the price of natural gas--the largest source of home heating--has tripled even while controlled, and the price of electricity--the third largest source of heating after gas and oil--has doubled.[13] Everyone, therefore, is bound to face higher prices for heating in a supply disruption and the ease and ability of adding these rebates to other rebates seems to make any inefficiencies of unequal need a worthwhile cost for adding these rebates to the system.

In terms of overall direct and indirect costs, winners and losers are not as easy to identify. It could be that those who are better off under the rebate plan are only capturing their additional indirect expenditures. One positive sign is the fact that additional payments and indirect costs are both higher in higher level income households. Without more specific information of the exact levels of these indirect costs by the various groups identified in this study, however, it is impossible to say if income is actually transferred between groups, or if the indirect cost of one group is going as payments for direct cost rebates for members of the same group.

Despite this inability to conclusively determine the overall indirect and direct transfer effects of the rebate plan on the four income groups, some conclusions can be made on the micro level of benefits within the groups. As mentioned above, the rebate for each member of a group is made on an average set of characteristics for members of that group.

To simplify, the rebate amount can be seen for any group in the form of an equation:

$$\text{Rebate} = f(\text{Wage, Workers, Working, Geography}),$$

where,

Wage = overall wage level, compared to non-wage income;

Workers = number of workers and their incomes;

Working = whether the person is working, unemployed, retired, or on welfare; and

Geography = where the person lives in the country.

To arrive at estimates for these groups the average of these factors was found for each and placed in the equation. Therefore, individuals in any group which deviate from this average will be worse off or better off depending on the relationship between the rebate and the factor used to determine this rebate. Averages for each of these factors for each of these groups were devised in Chapter II and vary across all the groups. The relationship to the rebate for each factor, though, is constant. This allows some conclusions about the relative position of individuals within the group to be defined.

Assuming all else to be equal, those households within a group which receive more than average income from nonwage earnings will be worse off than other members of the group. At the same time, the closer to parity are the two incomes of a family, the higher is the rebate of the family. In terms of benefits for specifid type consumers such as retirees, southerners and others, a household is worse off when it lies on a higher consumption plane within a group. One good point about a program which bases its rebate on numerous factors is that it statistically reduces the chances of extreme outliers.

Other Disruptions

Based on the analysis of the $50 billion rebate, we can summarize the characteristics of rebates at different levels of disruption. Comparing the modelled disruptions reveals that the size of the rebate to consumers relates directly to the size of the disruption. The total direct cost incurred by consumers under the rebate plan doubles each time the size of the disruption doubles. The same relationship holds for the amounts of additional money spent by the various groups on petroleum products, and hence for the amount of rebate sent to each group. Because these payments increase at the same rate, the

distributional aspect of the rebate program remains as outlined above for the $50 billion disruption. For all rebates, the proportion of the transfer that each group receives remains constant.

Since a rebate of a $100 billion disruption gives everyone twice what they received under the $50 billion plan, it would appear that the effectiveness of the rebate plan is independent of the size of the disruption. In a purely theoretical sense this is true. There are, however, factors at different levels of disruption that change the effectiveness of the plan because of the means through which it must operate.

Basically, rebates work in one of two ways. The first, which covers social security rebates, welfare rebates, unemployment rebates and non-covered rebates, involve increasing money payments made through these programs. At higher levels of disruption, this means more money must be available to cover these payments. Table 17 shows the levels of additional funding necessary to operate these areas of the rebate program. The ease with which this money can be channeled into these areas affects the overall effectiveness of the program.

The bottom of Table 17 presents the funds available to the government for each of the areas of the rebate program. Though these funds are used in already existing programs and cannot pay for the additional needs of the rebate program, the size of the existing program gives an indication of how well they could incorporate the rebated amount into their existing structure.

Social security represents the largest of the direct payment programs. In 1979, $124 billion was mailed out through the social security program. At the largest possible disruption of $400 billion, the $27.5 billion added to this total represents an increase of only 22 percent to the program. In addition the social security administration had $46.7 billion in its trust fund at the end of 1979. This amount is over 70 percent greater than a year of emergency rebates under the largest of disruptions. It is even possible, therefore, that social security could fund its own rebates immediately, receiving payments for

TABLE 17 CASH PAYMENTS OF REBATES UNDER DIFFERENT DISRUPTIONS

Rebate Amount (millions of dollars)

PROGRAM	$50B disruption	$100B disruption	$200B disruption	$400B disruption
Social Security	3443	6886	13772	27544
Welfare	838	1676	3352	6704
Uncovered	907	1814	3628	7256
Unemployment	1161	2322	4644	9288
Free cash needed	6349	12698	25396	50792

FEDERAL RECEIPTS BY PROGRAM

Total $456 billion

Source	Amount (millions of dollars)
Income Taxes	$203,600
Corporate Taxes	70,300
Social Insurance	141,800
Employment	119,700
Unemployment Insurance	15,900
Excise	18,400
Estate/Gift	5,700
Customs	7,500

Source: Statistical Abstract of the United States: Section 9, Federal Government Finances and Employment.

expenditures after the tax had been collected. This allows the social security arm of the program to be entirely independent and to require only a lump sum payment for its total expenditures. This will leave the agency free to develop its own strategy insuring the rebate for only those individual checks which cover all non-working households once.

Welfare rebates exhibit much the same quality as social security rebates. The $6.7 billion rebate under the largest disruption represents about 80 percent of the yearly AFDC payments, about half of all cash public assistance benefits, and less than 15 percent of all social welfare expenditures. At the same time, the welfare arm of the program also requires the identification of those welfare recipients who should receive rebates through this program. Again it is best if this aspect of the rebate program be autonomous and the method of implementation left solely to the welfare administration. The only difference is the probable need of financing from the onset of the emergency to the receipt of taxes. A separate account for borrowing should be set aside by the Treasury to allow departments to obtain financing. The government would then merely take tax receipts from suppliers and pay off these debts.

The last two areas of the rebate plan unfortunately can not be easily incorporated into existing structures. Though described individually, these programs are similar in structure, needs and drawbacks. These programs are the unemployment and uncovered programs. Basically, this area requires not only the generation of eligibility listsm but the addition of the coverage of the program to all those not on other lists. As this function involves adding outsiders to the system, this requires that the qualification of outsiders be checked. In addition, rather than being required to worry about a proportion of the population already involved in the program, the program is expanded by applying to others outside the program. This wide range of functions results in the part of the $400 billion transfer funnelled through this area being almost three times the program at normal times. Also, higher payments at higher disruptions

make fraud more likely. Altogether, these areas of the program will be the most costly to run.

Besides direct payments in cash, the second way which the rebate program operates is the reduction of taxes. From Table 17, it can be seen that $200 billion are collected yearly in income taxes. The total withholding reductions under the proposed rebate plan goes from $34.1 billion under a $50 billion disruption , to $272.8 billion for a $400 billion dollar disruption. This means that almost any disruption can be met through the existing withholding system.

There is, however, a technical consideration which becomes more and more troublesome as the disruption becomes larger. In essence, the rebate through withholding is internally financed on the firm level. The money is never sent to the government, but rather is funded from money that would have been sent to the government. This is an important distinction on two counts. First, individuals might not make enough so that their withholding payments would cover their would-be rebate. The second is that the firm on the whole might not collect enough tax payments to pay out the total rebates for its workers.

As the centerpiece of the rebate program, the avoidance of these problems is crucial. One does not want to penalize a worker just because a greater percentage of income is spent on higher petroleum costs than on federal income taxes. Given the regressive nature of the burden of higher petroleum costs and the progressive nature of federal income taxes, this penalty would be borne exclusively by the poor.

Obviously, there is a definite need to redistribute withholding taxes. The first way to do this is at the firm level. Firms with low income workers will be able to not only reduce their withholding to zero, but to actually increase income beyond this level. For accounting purposes, the firm would be required to list total estimated taxes, total withholding reductions, and total payouts. In this system, actual withholding taxes would be estimated taxes less withholding decreases, less additional payouts all computed on the firm level.

There are times when even this redistribution of withholding taxes by the firm would not cover all the rebate needs of its workers. Again, this is likely at small firms with lower overall wage structures. When this occurs, the firms can not be expected to pay government program money out of its own pocket, so alternatives must be provided. As Table 17 shows, in large disruptions individual income tax alone will not meet the needs of the program. If corporate income tax is added to the program, however, even the needs of the withholding program under the $400 billion disruption will be met. With this in mind, the first choice of a firm which has redistributed all withholding tax it was expected to collect will be a corporate income tax credit. This credit will grow until it equals the income tax payments of the company expected during the year. The firm must pay rebates to its workers until it exhausts this reserve.

For those firms where even corporate and individual income tax withholding are not enough to meet its rebate obligations, a final alternative must be made available. Like the program available to those individuals not covered by other programs, the government must have a program for those firms which can not meet their rebate obligations. This would allow firms to qualify for direct cash payments to meet any non-covered rebates. Like the program for individuals, this program can be established before a shortage is in progress. Since corporate and individual income taxes equal $274 billion, and the largest studied program requires $273 billion, the best plan would create a central authority to redistribute money from firms still paying taxes to those companies which still need money to pay rebates during any emergency.

In all, the cost of implementation can be seen as rising with the size of the disruption. Higher disruptions make the work of distributing the existing tax receipts to the appropriate people more complicated. It also increases the need for staffing of support services designed to insure coverage of the entire population without much waste entering the system. At the same time, however, the existing system seems capable of adjusting rather well even

to the massive needs of a $400 billion dollar disruption. In all cases, the program can remain decentralized into already existing channels through which the government and the general population interact. The role of a coordinator would only be that of a central clearing house. Money will be distributed to different accounts as needed. If it appears that the amounts funded to various arms are higher than predicted, the administer can investigate that program. If the programs function well, the administrator will merely funnel taxes to cover the outstanding borrowings of the constituent programs. This separates the funding from the functioning of the program, and avoids each department being worried about funding accounts and operations. This also allows the whole program to be kept separate from the federal budget as a whole. With all this accomplished, the rebate program is an effective method of dealing with a supply disruption of any forecasted level.

COMPARISON TO THE RATIONING PLAN

Up to this point, the study of the effectiveness of the rebate plan has been in comparison to the theoretical objective of returning the money to the people who bore the costs of higher prices. The proposed rebate plan, of course, is not perfect in meeting this objective, and the inefficiencies between groups and between members of groups have been detailed. At the same time, however, rebates have been shown effective in enabling everyone to recoup the added cost of direct petroleum consumption during an emergency. This effectiveness makes the plan a viable policy during an emergency. As such it should be compared to the present emergency plan, gas rationing.

Basically, the stand-by emergency rationing plan would divide all available gasoline evenly among all registered vehicles during an emergency. Though the program also calls for designation of national and state reserves and emergency and priority users, for this study the program is idealized as dividing all direct consumption of gasoline among all private owners of

automobiles.[14]

During any interruption, the assumption is that gasoline will be cut back at the same rate as the disruption overall, allowing higher prices in other uncontrolled markets to cut back other demand. For the $50 billion disruption which has been the focus of detailed study, this cutback equals 7.9 percent. In terms of coupons, this 7.9 percent reduction translates into 771 gallons of gasoline being assigned to each registered vehicle.

The top of Table 18 presents an overview of the system under rationing using the model presented in this paper. The price of gasoline coupon under rationing was found earlier as:

$$P_c = (P_w Q_D + [(1-dQ/Q)^{1/n} P_0 (I_0 - dQ)])/(I_0 - dQ + Q_D) .$$

This equals the difference between the controlled price of the product and its equilibrium uncontrolled price. Since the model of the rebate was based on the unconstrained market, the price of 147.3c per gallon under that scenario equals the equilibrium price. The value of a gallon under that scenario equals the equilibrium price. The value of a gallon coupon of gasoline was found to be 21.7c per gallon, and the controlled price of gasoline at the pump was found to be 125.4c per gallon. At the same time, the price of the other directly consumed petroleum product, heating oil, rises to the uncontrolled price of 125.4c.

The bottom of Table 18 presents the direct petroleum costs incurred under the rationing scheme. The <u>before</u> columns represent total costs of each product at pre-disruption prices, the <u>after</u> columns represent total costs of each product at the post-disruption rationed prices. Under rationing, the goal of preventing prices from rising works well. Under this control, everyone could buy the gasoline desired at a cost almost exactly the same as before the disruption. Unfortunately, this happy outcome rests on the proposition that each group receives ration coupons in the amount necessary to purchase the

TABLE 18: RATIONING UNDER THE $50 BILLION DISRUPTION/EXPENDITURES

Coupons per registered vehicle: 771
Price of gasoline: 125.6c per gallon
Price of heating oil: 125.4c per gallon
Value of 1 gallon coupon: 21.7c

Group	Number (1000)	Expenditure($) Gasoline Before	Gasoline After	Number (1000)	Expenditure($) Heating Oil Before	Heating Oil After
Two Worker Families (under 65)						
Poor	550	849	852	1706	742	917
Lower Middle	5696	1500	1503	3888	725	896
Upper Middle	7282	2190	2195	1706	793	981
Well Off	7483	2352	2358	1184	958	1184
Individuals/One Worker Families (under 65)						
Poor	4758	739	740	197	742	917
Lower Middle	15762	1304	1307	1405	725	896
Upper Middle	7419	1904	1909	1675	793	981
Well Off	5310	2045	2050	1669	958	1184
Aged (over 65)						
Poor	3483	385	386	214	742	917
Lower Middle	5183	699	701	531	725	896
Upper Middle	810	1054	1058	182	793	981
Well Off	798	1147	1149	160	958	1184

Source: See text for an explanation of the calculations.

gasoline shown in the table. Any misallocation from this perfect allocation means that those who desire more than their allocation proscribes will have to buy coupons from those who find they have an excess amount on hand. This functioning of a "white market" allows efficiency in the market, but it also creates transfers of income from one group to another.

As was said earlier, the distribution of these ration coupons is based on vehicle registrations. Each vehicle owned by a household under this scheme receives 771 gallons worth of coupons. Table 19 uses the distribution of car ownership to determine how transfers flow between groups on the white market. As shown, the lowest two income classes gain nearly a billion dollars each, while the highest two income classes lose nearly a billion dollars each.

Car ownership, however, is not a continuous function. Nobody can actually own three-tenths of an automobile. Instead, some households own two autos and some own only one. Because of the discrete nature of car ownership, actual gains or losses can change considerably within groups.

In the case where car ownership is not independent of miles driven, the distribution of benefits by the ration program is even more complicated. If, for example, two worker families tend to own an extra car, the extra benefits offset the extra driving done by this group as a whole. Unfortunately, there is no information available on car ownership by such characteristics as two worker families compared to one worker families. This limitation means that it is impossible to specifically present the numbers of people who fall in these categories. It is possible, however, to specify how a representative person in a given category would fare under a rationing plan as compared to a rebate plan.

Table 20 demonstrates some of the points made earlier about the rebate plan. In all cases, the rebate plan makes everyone at least as well off as before. The total effective rebate under the rationing program will be determined by the quantity of gasoline consumption and the effective price of the coupon, leaving room to cover the indirect cost. However, under the rebate

TABLE 19: WHITE MARKET INCOME TRANSFERS

Overall Households with Cars

Group	Number (1000)	Average Cars Per Household	Ration Coupons	Gain or Loss Per Household
Poor	8786	1.3	1002	112.6
Lower Middle	26647	1.5	1157	30.4
Upper Middle	15511	1.7	1311	-58.7
Well Off	15125	1.9	1465	-57.7

Total Transfers

Group	Number (1000)	Gain or Loss Per Household ($)	Total Gain or Loss ($million)
Poor	8786	112.6	989.3
Lower Middle	26647	30.4	810.1
Upper Middle	15511	-58.7	-910.5
Well Off	15125	-57.7	-872.7

Distribution of Car Ownership

Group	With 1 Car	Gain/ Loss	With 2 Cars	Gain/ Loss	With 3 or More Cars	Gain/ Loss
Poor	4579	62	1732	230	247	397
Lower Middle	16496	-53	7531	114	2221	281
Upper Middle	5655	-176	8240	-8	1616	159
Well Off	3176	-208	8924	-41	3328	126

Source: Newman and Day, Table 5-18

plan, we can now modify the payment to compensate for indirect (as well as the direct) cost of higher oil prices.

In addition to making everyone at least as well off after a disruption, the rebate program in all but a few cases makes some groups better off than under the rationing plan. The exceptions are those few cases where high car ownership and low income are combined. As shown earlier, however, this combination is extremely uncommon. In fact, the only group of any significant size to benefit by rationing are those upper income aged who own a car and who would fall under rebates from the Social Security arm of the program. In this case, the only reason this occurs is because these retired people drive very little yet are treated as any other recipients under the rationing system, while the rebate plan reflects their decreased driving.

It may seem a contradiction to claim that the proposed rebate plan is everywhere better for consumers than rationing. It is indeed impossible to divide a given amount of money two different ways and always make everyone better off one way rather than another. The answer to this riddle is that the sum divided under the rationing plan is smaller than the sum divided under the rebate plan. There is a loser in the rebate plan relative to rationing, but it is not the consumer. Rather, the losers are the suppliers of petroleum. As shown earlier, the rebate program redistributes $40 billion of transfers. The rationing program only prevents the capturing of transfers on gasoline. Gasoline accounts for $17.1 billion of transfers in the uncontrolled market. The $22.9 billion difference is captured by the rebate program and distributed as shown in this chapter. This extra $22.9 billion collected allows every group to receive more than would be received under rationing. On the other hand, under rationing the oil producers receive $32.9 billion, while under rebates they receive only $10 billion.

Overall, the rebate program outperforms rationing from the view of the consumer. Nearly everyone is made better off under the rebate plan, and more of

TABLE 20a: COMPARISON OF RATIONING vs. REBATE BY CATEGORY
COVERAGE OF DIRECT PETROLEUM COSTS

( ) = Loss
Rebate/Ration

Poor One Worker/Individual, No Oil Heat

Region	No Car	Drivers 1 Car	2 Cars	3 Cars
Northeast	346/--	217/ 39	217/207	217/374
Northcentral	342/--	213/ 39	213/207	213/374
South	238/--	109/ 39	109/207	109/374
West	282/--	153/ 39	153/207	153/374

Poor One Worker/Individual, Oil Heat

Northeast	129/(217)	--/(178)	--/(10)	--/157
Northcentral	129/(213)	--/(174)	--/(6)	--/161
South	129/(109)	--/(70)	--/ 98	--/265
West	129/(153)	--/(114)	--/(54)	--/221

Lower Middle One Worker/Individual, No Oil Heat

Northeast	453/--	224/(59)	224/136	224/276
Northcentral	452/--	223/(59)	223/136	223/276
South	351/--	102/(59)	102/136	102/276
West	373/--	144/(59)	144/136	144/276

Lower Middle One Worker/Individual, Oil Heat

Northeast	229/(224)	--/(283)	--/(88)	--/ 52
Northcentral	229/(223)	--/(282)	--/(87)	--/ 53
South	229/(102)	--/(161)	--/ 34	--/174
West	229/(144)	--/(203)	--/(8)	--/132

Source: See text for an explanation of the calculations.

TABLE 20b

Region	No Car	Drivers: 1 Car	2 Cars	3 Cars
Upper Middle One Worker/Individual, No Oil Heat				
Northeast	550/--	215/(163)	215/ 5	215/172
Northcentral	547/--	212/(163)	212/ 5	212/172
South	438/--	104/(163)	104/ 5	102/172
West	483/--	149/(163)	149/ 5	149/172
Upper Middle One Worker/Individual, Oil Heat				
Northeast	335/(215)	--/(378)	--/(210)	--/(43)
Northcentral	335/(212)	--/(375)	--/(207)	--/(40)
South	335/(103)	--/(267)	--/(99)	--/ 68
West	335/(148)	--/(312)	--/(145)	--/ 23
Well Off One Worker/Individual, No Oil Heat				
Northeast	662/--	263/(187)	263/(20)	263/148
Northcentral	618/--	259/(187)	259/(20)	259/148
South	487/--	128/(187)	128/(20)	128/148
West	541/--	182/(187)	182/(20)	182/148
Well Off One Worker/Individual, Oil Heat				
Northeast	359/(263)	--/(450)	--/(283)	--/(115)
Northcentral	359/(259)	--/(446)	--/(279)	--/(111)
South	359/(128)	--/(315)	--/(149)	--/ 20
West	359/(182)	--/(369)	--/(202)	--/(34)

Source: See text for an explanation of the calculations.

TABLE 20c

Region	No Car	Drivers: 1 Car	2 Cars	3 Cars
Poor Two Worker, No Oil Heat				
Northeast	503/--	354/ 20	354/187	354/355
Northcentral	498/--	349/ 20	349/187	349/355
South	348/--	199/ 20	199/187	199/355
West	410/--	261/ 20	261/187	261/355
Poor Two Worker, Oil Heat				
Northeast	284/(219)	135/(199)	179/(32)	179/136
Northcentral	283/(215)	134/(195)	174/(28)	174/140
South	237/(111)	88/(91)	24/(74)	24/244
West	256/(154)	109/(134)	86/(33)	86/201
Lower Middle Two Worker, No Oil Heat				
Northeast	655/--	392/(92)	392/ 75	392/242
Northcentral	660/--	387/(92)	387/ 75	387/242
South	505/--	242/(92)	242/ 75	242/242
West	554/--	291/(92)	291/ 75	291/242
Lower Middle Two Worker, Oil Heat				
Northeast	441/(214)	178/(306)	178/(139)	178/(28)
Northcentral	450/(210)	187/(302)	187/(135)	187/(32)
South	397/(108)	134/(200)	134/(33)	134/(134)
West	403/(151)	140/(243)	140/(76)	140/(91)

Source: See text for an explanation of the calculations.

TABLE 20d

Region	No Car	Drivers: 1 Car	2 Cars	3 Cars
Upper Middle Two Worker, No Oil Heat				
Northeast	829/--	444/(212)	444/(45)	444/123
Northcentral	824/--	439/(212)	439/(45)	439/123
South	660/--	275/(212)	275/(45)	275/123
West	728/--	343/(212)	343/(45)	343/123
Upper Middle Two Worker, Oil Heat				
Northeast	595/(234)	210/(446)	210/(279)	210/(111)
Northcentral	594/(230)	209/(442)	209/(275)	209/(107)
South	524/(118)	139/(330)	139/(163)	139/(5)
West	563/(165)	178/(377)	178/(210)	178/(43)
Well Off Two Worker, No Oil Heat				
Northeast	967/--	554/(240)	554/(73)	554/ 95
Northcentral	960/--	547/(240)	547/(73)	547/ 95
South	754/--	341/(240)	341/(73)	341/ 95
West	840/--	427/(240)	427/(73)	427/ 95
The Aged, No Oil Heat				
Poor	300/--	232/100	232/268	232/435
Lower Middle	300/--	177/ 46	177/214	177/381
Upper Middle	300/--	215/(15)	115/152	115/319
Well Off	300/--	(86)/(31)	(86)/136	(86)/303
The Aged, Oil Heat				
Poor	68/(232)	--/(132)	--/ 36	--/213
Lower Middle	123/(177)	--/(131)	--/ 37	--/204
Upper Middle	185/(215)	--/(230)	--/(63)	--/104
Well Off	(386)/(386)	--/(417)	--/(255)	--/(83)

Source: See text for an explanation of the calculations.

the total transfer is returned to the consumer. As noted earlier, with a vertical supply curve this whole transfer should be given back. It must be remembered, though, that this was merely a simplifying assumption.

Even though we cannot claim that $40 billion of returned transfers is the most efficient level of rebate, the rebate plan has the advantage of flexibility. If $40 billion were not the most efficient sum, the rebate amount could be adjusted. Even if the money returned by rationing were found to be efficient, the rebate plan still has the advantage of providing money to the general public based on considerations other than car ownership. Moreover, rebates have the advantage of working through existing channels without creating a new currency.

SUMMARY

In terms of adaptability, rebates are useful at all levels of disruption. By proscribing the desired outcome, changes in a very dynamic system cannot distort the results. Changes in need and mistakes can be quickly corrected. Most importantly, the program can react quickly to the onset of the emergency. Operating through existing channels the money is added to regular weekly, bi-weekly, or monthly payments. Unlike rationing, the rebate system is a continuously functioning, continually adjusting system. Dealing with an emergency means activating a dormant part of the system, not implementing a new system from scratch.

Finally, the rebate scheme not only functions more quickly, smoothly and efficiently, but it functions well while extending coverage to a wider population. This comprehensibility means that many of the households made worse off during an emergency are covered by rebates and not rationing.

CHAPTER IV: COLLECTING THE TRANSFER

In previous chapters, this study was focussed on how a rebate plan employs already existing government programs to quickly and effectively return consumer income lost during a reduction in petroleum supplies. Allowing prices to rise and modifying government programs insure the optimal use of remaining petroleum supplies. Increasing government cash benefits and decreasing income taxes guarantees that no one spends more of their income on direct petroleum consumption than before the disruption. The question that this chapter addresses is the ability to merge these two programs.

Simply put, if the money which the producing side of the market collects as prices are allowed to clear the market is not the same money which the consuming side receives as rebates, the sum of these parts will equal less than the whole. Taxing the wrong source redistributes but does not relieve the burden. Instituting the rebate program without collecting the increased revenues pumps money into the system and imposes an inflationary cost on the unprotected. If the oil shock of 1973 can serve as an example, both the recession caused by the burden and the inflation caused by trying to buy out of the problem can be more troublesome than the disruption.[1]

Depending on the state of the economy at the time of the interruption, the government may choose to distribute more or less of a rebate than the amount collected in taxes. A large rebate, for example, might be used to meet both an equity problem and to provide a quick stimulus to a depressed economy. Or, in a period of high employment and rapid inflation, a smaller rebate might be needed to avod undue exacerbation of the price spiral. For most of the analysis in this paper we have assumed that the rebate would be funded by collections from the energy industry. However, for the major focus of our analysis -- the design of a feasible ccombination of channels for disbursing the funds -- the assumption of equal collections is not necessary. We leave for a separate study

the matching of fiscal requiremnts and a rebate program.

CAPTURING THE TRANSFER

In matching consumption to expenditures, rationing is theoretically the best solution. The problem of collecting the consumer transfer is nonexistent simply because the use of price controls prevent the transfer from ever occurring. This retention of the surplus on the consumer side of the market gives rationing its great appeal. The oil companies are explicitly prevented from receiving any profits, and the costs of the inefficient use of petroleum and the transfers between groups remain hidden. Under gasoline rationing, as we saw in Chapter III, the denial is not total but is still appealing. Thus recapturing the transfer from the petroleum producers is the last step in an effective oil emergency program.

Facing the challenge of recapturing the transfer of consumer income during a disruption, two points make success easier. The first of these points is purely theoretical. Given that a firm is able to capture some economic rents, a direct tax on those rents will not change the profit maximizing price to the consumer.[2] This condition means that any part of the rent of a producer can be recovered simply by being identified and claimed. Regardless of the claim, the producer will not pass the price increase on to the consumer, and the total amount of the rent can be captured by the government. Unfortunately, oil producers do not keep a separate rent account, and the key to any effective tax is to identify the transfer, not just raise money.

At this point, the second positive point regarding the capture of the rents of a supply disruption guides our program. The government has already enacted a tax to capture some rents of the oil industry. On April 2, 1980, the Crude Oil Windfall Profits Tax was passed by Congress.[3] As the title states, the goal of this tax is to identify and tax the economic rents of crude oil producers. In order to do this it addresses the key question of identifying the

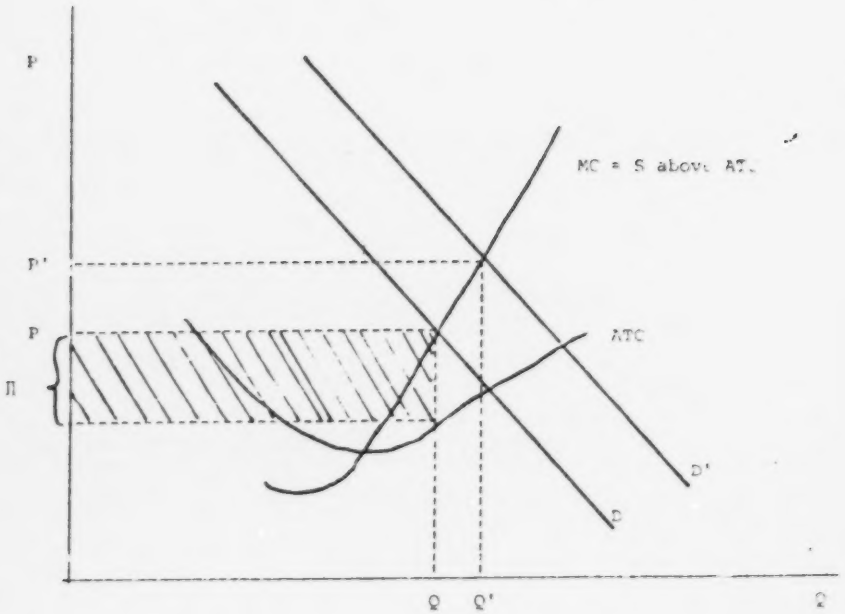
amount subject to taxation. This serves as a base from which the taxing of the consumer surplus will proceed.

The method by which the windfall profit tax identifies economic rents is to assume a base price which represents cost and a fair return on profits. Any oil sold for more than this price is subject to a tax on the difference. By using a base figure to calculate economic rents, the ability to differentiate between a highly heterogeneous group of producers is limited. The best way to see this is to return to the theory of rents. Rents are a function of the fact that the cost of recovering a marginal barrel of oil has been increasing over time. Figure 3 shows this relationship between cost and output.

Given a demand D, the market clears at price P' and profits are equal to PAP'. In a competitive nonrent environment, this profit would draw entrants into the market. Since profit in this case depends on price being above the least cost mix of production, firms would continue to enter at the most efficient production mix until all production was at the minimum average total cost P and profits were zero. For the oil industry, however, the higher marginal costs are the result of less productive fields and more inaccessible locations. When demand increases, entry occurs only at the higher and higher levels of marginal cost. The achievement of lower production costs is impossible, and the difference between these lower costs, and the cost of the last production needed to meet demand is the rent of the low cost producer.

The role of the base cost in the windfall profits tax is to identify where the firm is producing on the marginal cost curve. Unfortunately, there is simply no way to pinpoint this location. As shown, the only constraint on the system is that all oil be produced for less than the marginal cost of the most expensive oil needed to fill demand. Where the firm produces below this point, however, is uncertain. Because of the nature of the equilibrium, it is conceivable that a new discovery can be found with production costs lower and rents higher than all other operating wells.

FIGURE 3: ECONOMICS OF CAPTURING DISRUPTION TRANSFER



The solution that the Windfall Profits Tax reaches in differentiating between the different costs of production is to divide oil production into different tiers, each with a separate base price and percentage tax. Overall, the government ceiling price of March 1979 corrected for inflation is a bench mark price. Prices received above this are taxed at a 70 percent rate. Higher costs are accommodated by taxing tier two stripper oil at a reduced rate of 60 percent and tier three newly discovered or tertiary oil based on a higher base price and a lower tax rate of 30 percent.[4]

Despite the problems inherent in this means of calculating economic rents, if we accept these bases as the best guess at the relative position on the marginal cost curve these different types of oil occupy, then the tax for collecting the rents of crude oil producers is very simple. The various base levels used in computing regular windfall profit tax obligations at the time an emergency is declared should be used to figure out the economic rents of each firm. The amount that each firm receives above its applicable base should all be taxed at the same rate. Given the rebate need of $40 billion for a $50 billion disruption, the tax rate would need to be 80 percent.

DETERMINING THE TAX LEVEL

One important question which must be answered in developing the tax plan is exactly how much of the rents the government should try to collect. Up to this point, the simplification has been to assume that during an emergency, supply will not increase from the domestic market. In practice, there are methods which can increase short-term production at the cost of long-term production. In addition, allowing the price rise to flow to producers also creates a probability of a future payback if the investment of storing oil at stable periods is undertaken. Here the amount of private stockpiling is directly proportional to the amount of money this oil will bring on the market. Also, a full tax on rent gives no incentive for the oil industry to create a

stable market. As far as they are concerned, if they receive no price rise they might as well sell out quickly at the price they are allowed to keep and let the government have the headache of trying to meet shortages. Anyone who remembers gas stations that opened at 7:00 a.m. and closed at 9:00 a.m. during the shortages of June 1979, will realize that it is easier for stations to operate in this manner. In fact, given the value of leisure time and the need to pay employees and utility bills, it is actually more efficient for stations to operate in this manner. During this shortage, in fact, company operated stations were the ones that made the effort to stay open after hours.

If the full tax is not to be collected on the rents for the reasons stated above, then the question becomes how much rent should the government collect. It is not clear that the 20 percent left to the companies under the rebate plan of this paper is enough of an incentive to achieve the desirable results mentioned. What is important is that the rebate plan does leave a significant fraction of the price rise to the industry.[5]

It might, however, be necessary in some cases to give even higher prices than those permitted under the rebate plan to increase supply during a shortage. In this case, though, the indiscriminant nature of an across-the-board tax cut might not be the best solution. Just as different companies have different production costs and rents, different companies may have different abilities to respond to a disruption. Just as the windfall profit tax has tiers to account for the heterogeneous nature of production costs, the disruption tax might also be differentiated.

Creating these tiers is a difficult task, but at least a few possibilities come to mind. For one, the Department of Energy has been given the power to establish the "maximum efficient rate of production" and temporary "emergency production rates" for the domestic oil industry.[6] Under present law, the government must actually go around and establish these amounts, and when a shortage strikes, the government must order production at this higher rate and

make sure the order is enforced. The alternative to this plan would be to establish a lower windfall profit tax on production above the maximum efficient rate. Firms would apply for this consideration which would give them only a 60 percent rather than 80 percent tax on this production. By requiring these fields to be registered, cheating can be removed from the system. This is done by requiring that any production reached during nonemergency periods automatically be disqualified from emergency production consideration. Fields would not be registered unless it was only during times of higher prices that production was profitable.

Another type of consideration might be to allow firms to establish a stockpile of oil which can be sold only during emergencies. Again, in return for this, the companies would be allowed a higher return. Admittedly, this is only an overview to a very complex question, but the general thrust is more important. Rather than trying to dictate distribution, the government should use tax policy to allow a fair return and encourage emergency production and preparation. By doing this the 20 percent segment of rents not returned to consumers can be stretched to insure maximum emergency response by being divided partly into a general return for all producers, and partly into a tiered return rewarding positive action.

SUMMARY

This chapter has briefly tried to outline efficient ways a tax can be used to capture the rents which have occuppied the center of this study. Admittedly, this area is complex and deserves its own detailed study. Though this study is unable to do justice to this area, the reason it appears at all is because the ability to capture this rent is necessary to any further functioning, good or bad, of the rebate plan. As the assumption upon which any rebate plan is built, this area is often used in dismissing the consideration of rebates as a worthless effort. The main purpose of this chapter was to point out avenues that the tax plan can both work to capture the rents of the rebate system and complement its goal of easing the effects of a supply disruption. Much further work on this area needs to be done. Attacking rebates by arguing the inefficiency of taxing spurred me to write this chapter. The hope is that the efficiency of the rebate plan developed in this paper will spur further work on the development of a more detailed tax plan.

CHAPTER V: CONCLUSIONS

Disruptions in the world oil market cause two effects in the U.S. economy. The first effect is the overall wealth loss of the country because of the higher prices and lower availability of oil. If the U.S. market is uncontrolled, domestic oil prices also move up to match the price of imported oil. This causes a second effect of a transfer from consumers to producers within the country.

Transfers from consumers to producers occur when the domestic oil price rises to the world price. The unequal burden this price rise places on lower income groups, not to mention the loss of spending power faced by all income groups, has prompted calls to prevent domestic prices from rising to world levels during an emergency.

If this strategy is followed, keeping prices controlled leads to an excess of demand to supply for petroleum. In order to distribute gasoline in a way other than long lines and shortages, rationing has been proposed during an emergency. The introduction of rationing also introduces another element into the system. By controlling tickets, the government affects income by the criteria under which tickets are distributed. Therefore what began as an attempt to prevent changes in income distribution ends up a program where the government determines income distribution.

Any program designed to deal with this income problem inherits the income problem. This study offered a rebate program as an alternative means of running this income policy. A rebate program first of all is honest. Rather than dealing indirectly with income, this program changes income directly. The advantage of this method is that it does not rely on and distort the oil market for a goal outside the market.

Having identified and separated the goal of not letting a disruption disproportionately affect one group, the rationing and rebate plan were compared

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relative to this goal. Under both rationing and rebates, two characteristics were found to define the position of an individual. The first of these was consumption of petroleum products. No matter what program was used, the same amount of products was available to be distributed. With the same amount of petroleum to be distributed, the real difference in these programs is the benefits paid under each system relative to this general price level. Given a disruption, it was found that these benefits determine who gains and loses.

Unfortunately, though benefits were projected for different groups based on the criteria of the rationing program, no comparable rebate program had ever been proposed. This study developed a rebate program so that further comparisons could be made.

In order to develop a rebate program which did not overestimate the ability to target the consumption differences already identified, some constraints were put on the system. The requirement was made that any rebate program act through existing mechanisms. Thus, just as the gasoline rationing plan shifted through the existing alternatives of distributing coupons on a per capita basis, or a licensed driver basis, and on a registered vehicle basis to arrive at its program, so this study chose between all existing tax and transfer programs.

The solution this study reached was to further limit itself to those programs which involve regular interaction between government and consumers. Though this reduced the ability to identify characteristics such as wage income compared to property income or two income families from one income families, this meant that a plan superior to rationing with these constraints was even better because of the speed at which these rebates occur compared to the slow process of printing coupons, finding names and addresses (many out of date), and actually mailing checks.

Given these constraints, the rationing plan reaches over 97 percent of the population directly through Social Security increases, withholding tax

decreases, AFDC increases and unemployment insurance increases. Furthermore, the system is amenable to decentralization so that each area not only provides names and addresses, but actually runs the programs. With this developed system, the rebate program covers everyone for the direct cost of petroleum. On the other hand, numerous classes of the population are worse off under rebates. Rebates capture and return, without any overwhelming bias, over twice the amount of money as rationing. Rebates return this money quickly, equitably and without having to operate through the market. Rebates do not only have to be considered theoretical ideas demonstrating efficiency to the classroom. Rebates add efficiency to dealing with the actual problem of oil supply disruptions.

Mr. HOGAN. In summary, Mr. Berman showed that a combination of increased social security payments for 13 percent of the population, decreased withholding of income taxes for 79 percent of the population, increased welfare payments for 3.4 percent of the Nation, and increased unemployed insurance for 3.5 percent would leave less than 3 percent of the population without some form of an appropriate rebate through existing systems.

Senator LONG. Would you mind repeating those figures? I would just like to hear that again.

Mr. HOGAN. Yes, sir. Senator, the figures were: 13 percent by way of Social Security system, decreased withholding of income taxes for 79 percent of the population, increased welfare payments for a 3.4 percent of the Nation, an increased unemployment insurance for 3.5 percent would leave all but about 3 percent of the population covered by some kind of appropriate rebate.

There will be some difficulties in eliminating duplication, but it seems to be that that is also feasible if we take the effort in advance—as has been recommended this morning by Senator Bradley—to identify a duplicate coverage problem. And to remove those from the payment system.

By further exploiting regional variations in a rebate formula to recognize differences in energy consumption and capitalizing on compensating errors in each of the individual components, the net package would meet the equity goals and could be put in place quickly.

Although this specific proposal is only a first step in the design of a practical recycling plan, it demonstrates that such a system is possible within the framework of existing government institutions. Launched early during the start of an oil emergency, the "prebates" could come in advance of tax revenues and mitigate some of the worst economic effects of an oil supply interruption. If we plan in advance, we will be able to enjoy the benefits of a market response to allocating scarce oil supplies. A tax "prebate" scheme is a pragmatic possibility that could outperform the sorry record of our past attempts to regulate energy markets.

And if I could borrow from Senator Bradley, the system is more efficient than price controls and allocations. And it is more equita-

ble because it is directed at the equity problem. This plan suggests that it is also at least as feasible as a control and allocation program.

Senator DURENBERGER. Thank you, Mr. Hogan.

[The prepared statement follows:]

RECYCLING AND OIL SHOCKS

Testimony of William W. Hogan*
Senate Finance Committee
December 8, 1981

I want to thank the Committee and the Chairman for this opporunity to testify on S. 1354 and the tax/recycling aspects of emergency preparedness.

Virtually everyone who has reviewed the economic impacts of the previous two oil supply interruptions has concluded that the market distributes shortages much more effectively than do government allocations. This efficiency benefit does not, however, preempt the logic of a tax-recycling system, because of the large macroeconomic costs of large oil supply interruptions, the "fiscal drag" from increased revenue from oil taxes, and the resulting large changes in the pattern of income distribution.

Any recycling system must be built around a number of management, equity, and macroeconomic concerns. A simple rebate would be unfair since most of the funds would be distributed through the income tax of social security systems, while large numbers of the poor are not covered by these systems. A complex system aimed at "perfect equity" would bog down and might result in delayed payments with adverse macroeconomic impacts. It will not be easy to optimize all three objectives, and many options that might score well on both equity and macroeconomic grounds may simply be administratively infeasible.

Within the broad mandate of deciding how to use the fiscal system (tax and spending sides) to alleviate some of the economic problems of oil supply disruptions, we must emphasize a combination of three goals: (1) improving economic efficiency, (2) pursuing macroeconomic stabilization, and (3) preventing regressive shifts in the existing income distribution. The bulk of analysis to date has focussed on the first of these goals, for example, in comparing tax/rebate and coupon rationing systems. Only recently have we begun to analyze the macroeconmic connection, which is the subject of research by Messrs. Hubbard and Fry. My concern today is to advance the debate on the income distribution issues by outlining the channels for distributing quickly large amounts of money in an effort to redress the effects of an oil supply interruption. The first step is to design a specific recycling plan that can be subject to scrutiny.

To this end I have submitted for your consideration one detailed proposal developed by Jonathan Berman of Harvard University's Energy and Environmental Policy Center: "Rebate Strategies for An Oil Emergency." In summary, Berman shows that a combination of increased Social Security payments for 13% of the population, decreased withholding of income taxes for 79% of the population, increased welfare payments for 3.4% of the nation, and increased unemployment insurance for 3.5% would leave less than 3% of the population without an appropriate rebate. By exploiting regional variations in the rebate formula and capitalizing on compensating errors in each of the individual components, the net package would roughly meet the equity goals and could be put in place quickly.

Although this specific proposal is only a first step in the design of a practical recycling plan, it demonstrates that such a system is possible within the framework of existing government institutions. Launched early during the start of an oil emergency, the "prebates" would come in advance of the tax revenues and mitigate some of the worst economic effects of an oil supply interruption. If we plan in advance, we will be able to enjoy the benefits of a market response to allocating scarce oil supplies. A tax/prebate scheme is a pragmatic possibility that could outperform the sorry record of our past attempts to regulate energy markets.

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* Professor of Political Economy and Director of the Energy and Environmental Policy Center at the Kennedy School of Government, Harvard University.

TESTIMONY OF GLENN HUBBARD, GRADUATE STUDENT, ECONOMICS DEPARTMENT, HARVARD UNIVERSITY, CAMBRIDGE, MASS.

Mr. HUBBARD. I am Glenn Hubbard. And this is Robert Fry. We are graduate students in the economics department at Harvard.

The economic costs of a large oil supply interruption necessitate some sort of public policy response. We find that a proposal like S. 1354 is likely to better serve our national economic interests than would the alternatives of doing nothing for controlling oil prices.

In the prepared statement that we submitted, we discussed the disadvantages of doing nothing or imposing price and allocation controls. As economists, you know we are going to tell you that market pricing of oil during a disruption is the best idea. No one is likely to criticize the efficiency of the market pricing mechanism.

Any criticism of S. 1354 would have to be leveled at points of equity or administrative feasibility. We have, however, in the prepared text, documented the advantages of the Bradley-Percy proposal on those grounds as well.

It is very important, though, that we construct the mechanism that triggers the revenue recycling program so that first we do not: (1) needlessly activate it when we need it, and (2) that we can activate it quickly in the event of a very large supply interruption.

S. 1354 provides for a specific price increase. Namely, a 30 percent rise in the world price of petroleum products over a 3-month period, which would trigger the proposed revenue recycling program.

There may be a problem with the use of the world price of petroleum products as the trigger. Because of long-term contracts, OPEC contract price behavior and other rigidities in the market, the average world price adjusts quite slowly to changes in the world oil market. There's a much better case for using the crude oil spot market price as a trigger. Spot price data, after all, was available in the very short run, while other data is available only with a lag.

Moreover, the spot market tends to react much more quickly, as opposed to other oil prices which react with a lag.

We have in progress a more detailed empirical study on the effects of various policy alternatives, but the results that we have today are suggestive. To empirically test the effects of the three alternative policy responses: doing nothing, controlling oil prices, or implementing a revenue-recycling program, we have prepared some simulation results from our model of the U.S. economy in the world oil market. Our test case is a disruption in the world oil market of 10 million barrels of oil per day. That is roughly equivalent to the loss of Saudi Arabian production.

Table one in the handout we submitted reports simulation results for relevant oil markets and domestic economic variables under a "do nothing" policy. Table two reports results under the assumption that price controls at $34 per barrel are imposed at the onset of the disruption. Table three reports results under the assumption that a revenue-recycling program redistributes the incremental windfall profit tax revenue through tax reductions and increases in the various transfer payment programs. Proceeds are assumed to be rebated with a one-quarter lag.

Upon examination of the first two tables, we can see the potential harm in using crude oil price controls. In conjunction with the entitlements benefit program, the controls lowered the marginal price of oil faced by refiners, raising U.S. oil demand and raising U.S. oil imports.

As you can see from the table, world oil prices are much higher as a result of our price controls. Indeed, the acquisition costs of crude oil from foreign sources is fully 16 percent higher under the price controls regime than under the market regime.

The increased price and quantity of oil imports is primarily responsible for a reduction in real income and an increase in unemployment. The simulated growth rate for 1981 is a full percentage point less than it would have been under the market regime. By the end of the interval, the overall rate of inflation is actually just as high under price controls as without them.

Moreover, we didn't assume any sort of negative domestic supply response of price controls to deliver these results.

Looking at the last table in the handout, you can see that a revenue recycling program like the one described in the Bradley-Percy proposal bolstered real income without overheating oil demands. Unemployment is lower. And real income is higher than under the other two options. GNP growth is slightly higher than under the "do nothing" policy, and much higher than under the price control regime.

This sort of rebate program could be a major antirecessionary device. In the event of a small disruption, there's a good case for no Government intervention. During a large disruption, however, some intervention may be necessary.

Given that a proposal like S. 1354 dominates price and allocation controls on the grounds of efficiency, and cost effectiveness and that it can address the necessary considerations of fairness at the same time, the choice is clear.

Senator DURENBERGER. Thank you very much.

Let me start out with a couple of questions so I can clear up in my mind here where we are talking about an income distribution system, or redistribution system, or save our social security system or real emergency preparedness. Let me start by asking all of you about efficiency.

All of the witnesses who favor 1354 over some kind of price and allocation control seem to favor it in the name of efficiency. And I take it in that context we are talking about economic efficiency, the allocation of resources at their highest value and use. And I understand how markets further this principle, but I don't understand how inefficiency is avoided by allocating dollars rather than oil.

And let me take the example of one barrel of oil increasing in value because of a disruption. In the case of allocation and price controls, we deny the price increase to the domestic producer by forcing the sale of that barrel to some specific party at a specific price, which is less than market clearing level.

In the case of recycling, it seems to me that you allow the market clearing price to be collected by the producer and then you tax it away and give it to some oil consumer in the form of a rebate.

Now, considering that example, on what basis is it that you claim recycling is more efficient in an economic sense than allocation? It's not the market clearing prices that determines efficiency, it's who gets the resources in the end. And it seems that both cases—the result is pretty much the same so where is the efficiency advantage of recyclying?

Mr. HOGAN. Senator, there are two components. Under the recyclying proposal, if you have market clearing prices, the consumer, receiving additional income because of the recyclying still has to make a choice at the margin about whether or not to purchase and consume a barrel of oil. The consumer is facing the true world price. Too many consumption decisions which would be attractive in a price controlled environment but not be in the interest of the Nation, we would be using it for activities which are less valuable than the cost in the imported oil market—many of those activities will now be foregone voluntarily by the consumer, voluntarily in the face of higher prices.

The second feature of the recyclying sytem is that you do not have to allocate. You can allow people to make these decisions at the margin; it is not necessary for the Government to get involved in directing the flow of oil through base period allocation systems and the like. There is more flexibility for the system to respond because it's not restricted by arbitrary administrative rules about how the oil should be distributed. That increases the efficiency of the operation of the sytem just in terms of practical bureaucratic matters. You get both kinds of efficiency. You get the economic efficiency because the consumer faces the true cost of oil. And you get administrative efficiency because it is not necessary to direct from Washington every important decision about where oil is going to go.

Mr. HUBBARD. If I could add just one thing to that, Senator.

Senator DURENBERGER. Yes.

Mr. HUBBARD. I think part of the relative inefficiency of the price control program comes from an interaction of the price controls with the entitlement benefit program we have had. We documented this case that price controls were actually raising the world oil prices by encouraging more oil demand and, thus, with a fixed supply, more oil imports. That has macroeconomic implications.

Senator BRADLEY. Could you quantify that?

Mr. HUBBARD. In the tables in the prepared statement, Senator, the income numbers are qualified.

Senator DURENBERGER. Let me get to a follow-on question. Others may want to take on your responses.

But in this whole argument between recyclying and allocations you seem to focus pretty much on the redistribution of wealth between domestic oil producers and domestic oil consumers. In recyclying you do that with tax turnbacks. And in price controls we do it by trying to prevent the wealth transfer in the first place.

But suppose that our petroleum policy could be used to deny leverage to an OPEC cartel during a disruption and that we could have a policy designed to keep market prices down. Then the whole redistribution question never arises in the first place.

For instance, this strategic petroleum reserve. Using the SPR for economic purpose could be such a policy. We could get through—it seems to us, and the testimony that we have had in the Energy Committee—it seems we could get through a fairly sizable short-fall without substantial price increase if the SPR had 750,000,000 barrels of oil. And then we wouldn't have to rely on Malcolm's friends with the floating storage or whatever. We could even play the role that Saudi Arabia played during the Iran-Iraq war.

So isn't this price stabilization role really a more important issue in petroleum policy than the redistribution issue that's raised regarding that?

Mr. HUBBARD. I think you do definitely want a good role for the strategic petroleum reserve. For instance, we witnessed in the last interruption panic inventory buying pushing up oil prices. If you had a strategic petroleum reserve, which was there with enough oil to draw down, you could stop a lot of that problem.

I think you are absolutely right. That's a primary focus for policy.

Senator DURENBERGER. OK. Senator Long.

Senator LONG. Let me just ask you this: What is our energy short-fall as far as the overall is concerned? Who can give me that answer? All of us should know it. In terms of BTU's, our energy short-fall, do you include all sources in terms of what the demand is and what we are producing? What is our short-fall overall? What percent of our requirments of energy are we producing from all sources?

Mr. HOGAN. If you think of oil imports as a short-fall, as difference between domestic demand on omestic production, then you are correct. We don't have a short-fall in the sense of people wanting to get energy supplies that are not available anywhere in the world. But obviously, some supplies are expensive.

Senator LONG. I mean domestically. To what extent does our American production of energy from all U.S. sources fail to meet our domestic consumption?

Mr. HOGAN. I would use the import figure as the estimate and that's on the order of 6 million barrels per day. The total, in round numbers, is about 40 million barrels per day, or equivalent, so the shortage is 6 out of the 40.

Senator LONG. You are including all sources energy connected? High drill and all the rest of it?

Mr. HOGAN. Yes, sir.

Senator LONG. All right. Well, that would be like, what, 15 percent short-fall on the overall?

Mr. HOGAN. Yes, sir.

Senator LONG. Well, it has seemed to me—not just recently but many, many years—for a period of more than 20 years that the answer to the overall problem was that we ought to produce our requirements of energy. I'm not just talking about as far as the United States is concerned. I'm talking about what it means as far as the whole wide world is concerned.

For example, the Arab countries with that boycott can do a lot more to this world than just make money for themselves. They can tell countries that if they don't side with the Arab world in the United Nations when it comes down to a security matter involving

Israel and the Near East, for example, that they are not going to sell them oil, cut them off.

It puts the Soviet in a position to put pressure on people, especially when they build that gas pipeline through Eurpoe. Not only economic but politicai pressure in addition to the military threat that they pose to people.

It tends to undermine and destroy the potential leadership of the United States in the free world to do things that might avoid World War III or prevent it or survive it if it should happen to us. And also help the free world to survive it.

Now, here, for many, many years we have been dealing with these things to try to make comfortable the fact that America can't produce its requirements of energy. We have the potential of producing more of all forms of energy. Goodness knows, we could easily double our coal production one would think. We could make energy out of that shale out there with which very little is being done. We've go enough of that to last us for hundreds of years. We could do a great deal more with atomic if we wanted to. We could even do a lot more with falling water if we wanted to.

And the question I ask is why shouldn't we do, while we have the chance, what we should have done a long time ago? And that is, to make this Nation energy sufficient. Wouldn't that be a better answer?

Mr. HOGAN. Well, your points are well taken, Senator. It is certainly true that the United States has the resources and the capability to expand its domestic energy production. And could expand it enough to eliminate all oil imports.

There are some difficulties with that, however, particularly, as a policy for dealing with oil supply interruptions, the issue before the committee this morning. The principal difficulty is that even if the United States was successful in eliminating all of its oil imports, that there would clearly provide benefits for the rest of the world, we would still not be indifferent or protected from the problems of oil supply interruptions because of the effect it would have on our allies. We could not stand by and let the European economy or the Japanese economy suffer a great depression faced with a major cutoff of oil supplies. So import independence does not eliminate the security problem for us, although it certainly would help.

Anslysis of how far one might go suggests that we, in fact, could increase our domestic production and reduce our demand. And it would be to our net benefit. The problem with that is that the price of oil in the world market is too good a deal for the private consumer. And the benefits that you are alluding to, the security benefits and the benefits to the world economy, are not going to be captured by that private consumer. So without some form of Government intervention, some kind of import fee such as was suggested this morning, or similar type policies, the market we see is not going to produce that result.

If you do the calculations carefully and look at how far you would go, then the United States acting alone would still end up importing some oil although less than we are now importing. If we succeeded in developing a cooperative program with all our allies, this would provide further incentives which, in addition, might increase our production and decrease our consumption. And it is con-

ceivable that the target you are talking about, import independence, is within the range that would also make economic sense over the long run. And it's a policy worthy of attention. But it is really not a solution to the emergency preparedness difficulty. We would still have to consider programs such as we are talking about today even if we had no oil imports.

Senator LONG. Well, maybe I ought to be talking about the type of advice that Jesus gave to the Pharisees when he said, "Do you these things, but leave not the other undone."

Now it seems to me the answer to our problem is to make the United States a powerful producing country that it once was. And for many, many years, for many, many years, even going back before the Arab boycott, the problem was that people were scared to death that somebody was going to make a profit or make a big profit. My reaction is that we ought to hope they would. We ought to hope it would be so attractive that everyone would be drilling. For example, we hear these glowing reports out of the Department of Energy that we have more drilling rigs operating now than we did in any period of our history. Well, they are talking about a time when we had a surplus production of energy when we had more drilling rigs operating. We ought to have twice as many operating now as we did then.

In Louisiana, we have drilled more wells per acre than any State in the Nation. Now notwithstanding that, we can still find enormous amounts of energy just drilling in areas—in areas by the way that have already been drilled.

For example, you take the farm that I have at Baton Rouge. That's where I live. When I bought it, there was a dry hole on there. I certainly would have discounted any prospects of anyone finding any oil on that property and now someone wants to pay me a good price to go in and drill deeper. He is confident he will find something. In fact, he thinks enough of it to pay a rather substantial sum of money for the privilege of going back and drilling right where there is a dry hole already because he thinks that those people gave up too soon. They should have drilled down to 10,000 feet rather than stopping at 5,000.

But if we have all that kind of prospect in Louisiana, the good Lord only knows how much prospect you have in areas that have been drilled very little. For example, you take the Appalachian area. That's where you start out with oil. And I am told that one of these days somebody is going to find that the oil and gas in the Appalachian area is just deeper than they think. But the experience seems to be that all over this world you have about as much prospect of finding oil or gas one place as another.

And that's the area where we were supposed to be running out first. Now in coal, we have got enough to last for hundreds of years. Why shouldn't we have doubled coal production?

Mr. HOGAN. Well, as I said, increasing domestic energy production of all forms is desirable. And Senator Bradley knows that I've done analysis of this question of how much we should be willing to pay above the price of oil imports for increased domestic energy supplies and reduced energy consumption. In round numbers, something like a 30-percent ad valorem fee on oil imports would be a good measure of the difference between what we now pay and

what we should be willing to pay. That kind of incentive would produce many of the results that you are now talking about.

Senator LONG. Please understand that I am in the energy business. If you will show me any place where you think you have got a chance to be successful in the drilling of oil and gas, I would be willing to put some money in it. I would find the dough to take a small piece of it. Anywhere you think you have got a good chance of finding something, if you can make a good convincing case, I would be glad to go along with you. But I am willing to go beyond that. I don't feel like putting my money into it. I would be willing to put some Federal money and just damming up some of those low head streams you have got up there in New England, say maybe 50 miles of that big university where you are, just to catch some of that low head power. Because there is a lot of that. There is all kinds of power we could be capturing.

It just seems to me that once the crisis is over, you can't get the people to think about the fact that we have an energy shortage. And that's a bad thing not only for the United States—it's even worse for other parts of the world—it's bad for the whole free world for this situation to continue. And I would hope that you and others would be using your influence to do the big thing. And that is, not just deal with little inconvenience that is going to occur when these people shutoff our energy but to fix it so that the whole free world can survive when they put the squeeze on us the next time. And we ought to be doing more about that. Do you agree with that?

Mr. HOGAN. Yes, sir. I agree with that wholeheartedly. And I emphasize that what you are doing today, dealing with emergency preparedness, is not competitive with that set of actions. In fact, it complements it. And we should be doing both. And I concentrated my remarks this morning on the immediate subject, but I agree with you wholeheartedly about the broader subject.

Senator LONG. Well, I think I would be willing to do more in this area if you could get the people who support the Bradley bill to do more about producing energy, period. Because I think the answer, as I said, is to do both.

Senator DURENBERGER. Thank you. Senator Bradley.

Senator BRADLEY. Let me just say to Senator Long that if the vote on the Senate floor is any example, you wouldn't be getting too many votes for that agreement to support more production in addition to supporting this bill.

Senator LONG. Well, you never know if you don't try.

Senator BRADLEY. That's right. [Laughter.]

Let me make the point that Mr. Hogan made again. And then reflect on what Senator Durenberger said.

Emergency preparedness is two components. One, stockpiling, SPR. And the other is this mechanism to deal with an emergency when you don't have a sufficient stockpile. You know, clearly the evidence is the difference in price run up from 1979 and 1980. Two disruptions. In 1979 during the Iranian revolution, it went up dramatically. In 1980 during the Iran-Iraq war it didn't go up very much.

The difference in that is that in 1 year we had a heck of a lot of oil in private stockpiles, 1980. And in 1979 we had virtually no oil

in private stockpiles. So the reason that the price went up—you would confirm this—is that people were in the midst of a cutoff, running to get stocks. And when they ran to get stocks, they bid the price up even further than it would have been otherwise. In 1980, the stocks were at an alltime high level when the Iraq-Iran war began. And they drew down slightly on stocks and prevented the price from going up.

Is that correct or not correct?

Mr. HOGAN. That's correct.

Senator BRADLEY. So even if you had an action stockpile policy, unless you have 750 million barrels in storage, you still need this kind of recycling policy, which leads me to the questions that I wanted to ask about the bill.

The issue is what are we going to do with the revenues that are going to come to the Federal Government in any event? If you have a disruption, you know one thing, the price of oil is going to skyrocket as a result. Windfall profits and tax revenues are going to increase; the Federal Treasury is going to have more dollars. What do you do with that?

And the hypothesis of this bill is you recycle it back to people and let them have the money to cope with the higher energy prices that the market took the prices to. The issue is how you do that.

In your program, the one that was submitted, the Berman program, you go into great detailed recycling programs. Very detailed. And in the one that we have talked about in the committee, it is more or less across the board in nature for income tax cuts. And a block grant to Governors to have them deal with some of the equity issues, the farmers, the fishermen or whatever is the unique problem in that State.

The trade off between those two approaches on recycling appears to be speed, speed of implementation versus the ability to target the assistant to someone's definition of what's the need.

Do you have any feeling about which attribute is more important: Speed or the ability to precisely target to take care of everyone from the fishermen to the little old lady in Des Moines?

Mr. HOGAN. Well, I have an opinion. I haven't analyzed this, I must confess.

Senator BRADLEY. And I might also ask, "Does it matter?"

Mr. HOGAN. Well, precise targeting is very difficult in any system like this. We certainly saw this in price controls and allocations. And I think it will be true in the recycling mechanism. Very difficult to target effectively. There will always be many people who are not adequately compensated, certainly in their judgment and in the judgment of independent observers. And others who receive too much. We have to face the fact that we are going to have that problem. We can do some refinements to try to eliminate the most egregious kinds of difficulties. But we cannot hope to have a perfectly targeted system.

The speed question, however, is both more important and there is more that we can do about it. It is quite possible, given our track record, that we will not be fast. It is quite possible we could come too late and be countercyclical; to miss the solving the problems of fiscal drag and then cause this big surge so that it exacerbates inflation.

If I had to make a choice today, I would put more weight on speed and less weight on targeting.

Senator BRADLEY. So that would mean that you would then be inclined more toward across-the-board nature of a tax cut, which would affect, by your own testimony, 79 percent of the people of the country. Right?

Mr. HOGAN. We should include that. I'm not sure that—particularly if you do the preparation in advance—that we can't also use social security, unemployment insurance, increased welfare payments and so forth.

Senator BRADLEY. That would be 95 percent of the people.

Mr. HOGAN. And it doesn't noticeably slow the system down, if you are able to do the preparation and design in advance, as you suggested earlier.

Senator BRADLEY. So the idea—and the block grants fit into this in what way?

Mr. HOGAN. We have not analyzed block grants, but it is a reasonable suggestion. And it could be incorporated in such a proposal. Particularly, because it gives some additional flexibility to the States to adapt to their unique situations.

Senator BRADLEY. So instead of trying to write an elaborate Federal formula to make sure that the fishermen get their allotment, what you would say is you would give the Governor of Maine a certain chunk of money and he could deal with the fishermen the way he felt was the most efficient way to get them the money they needed. Right?

Mr. HOGAN. Yes; and the experience of the past has been that the special groups with special problems were quite small in number and quite small in volume—yet we redesigned the whole system in order to target for those small special groups. The block grants to the Governors would allow them to handle it without disrupting the whole operations of the economy.

Senator BRADLEY. In my bill, there is a segment that deals with the Strategic Petroleum Reserve. And it provides for an auction of the oil in the Strategic Petroleum Reserve. Do you agree with this approach? Or do you think that there should be some kind of allocation by Government out of the reserve?

Mr. HOGAN. I favor the auction approach. It is much more consistent with the market philosophy of this whole package of emergency preparedness. And much more likely to make this Strategic Petroleum Reserve effective in accomplishing Senator Durenberger's objectives of moderating world price increases.

Senator BRADLEY. Do you think the reserve should be used early or late in a disruption?

Mr. HOGAN. This and some of the issues associated with recycling depends very much on the circumstances that you will be involved in. You could imagine types of interruptions where—because of trends in consumption—for example, it would make it desirable to use the reserve early. In other trends it would be desirable to wait. For example, if you are in a situation where there is a very low level of private stockpiles, and if people are going through the experience of 1979, which is the panic acceleration of purchases in the stockpiles, exacerbating the shortage, then early use of the reserve would seem to make sense.

If you are faced with a very large interruption and large private inventories, then you might want to save the Strategic Reserve for possible downstream operations, and let the private stockholders of stockpiles use those in the early days.

These issues need careful study. I don't think there is a simple answer about whether it should be used early or late.

Senator DURENBERGER. I am going to ask you shortly, if the chairman of the subcommittee doesn't return to chair the hearing, if that is all right with you. Do you have that kind of time this morning?

Senator BRADLEY. Sure.

Senator DURENBERGER. I just have one more question. I think to make clear on the record of this hearing at least, the position of those of us who favor the price and allocation approach as opposed to the recycling approach—it isn't because we disagree or think that the recycling option is that much less efficient in the minds of economists like you all. But that I think we really believe that a marketplace can work out there if the market knows exactly what is going to happen in a shortfall.

Recycling just says that we accept as policy that all the incentives of the marketplace that drive the prices up during a disruption is going to be part of our policy. And we are, in effect, telling OPEC in the OPEC nations that in an emergency, we are going to continue the past practices of spot market purchases which drive up the price. And then we are going to come along with a tax which falls on 60 percent of the producers, our producers. It does not fall on the OPEC nation. We are going to take that tax and send it back to Governors in the form of block grants or whatever it is.

The notion of the market and as interrelated with a national energy policy assumes more than the Strategic Petroleum Reserve. I happen to think as long as we have got it and there is a commitment to it—I think everybody on this committee has fought very hard to fill out that commitment to the SPR, but that's just part of it. There's also a marketplace out there of producers and refiners at work. And in the case of a shortfall, we would certainly anticipate that those who would rush to the spot market are those that have refiners that just can't afford to sit and let those refiners operate at—I don't know what the magic number is—something less than 75 percent. When they get down to that point then that's when they rush out into the marketplace. But they have other alternatives. They have Mobile, and they have got Exxon and they've got Sohio and they've got a lot of other folks out there. And that's at least, in part, the notion of using price and allocation. That there are other supplies available which a sharing program, appropriately designed, would help us get at.

Now given that, given where we are headed on the Strategic Petroleum Reserve, and given your analyses of our last two disruptions and your hypothesis about the 10 million, on what basis do you suggest that we not look at price and allocation but go to recycling? What can you use to sell us the fact that the approach that some of us choose is just not going to work?

Mr. HOGAN. I personally agree with your objectives wholeheartedly. Reducing spot prices, reducing world prices is very much in

our interest. The problem is that domestic price controls are not the route to do that. In fact, domestic price controls work in the opposite direction, which is stimulating import demand and raising prices on the world market. We don't have control over the prices of OPEC producers in foreign oil imports. We cannot control them. When we control only our own, we provide an incentive for people to—by the way we have done it in the past—import more.

The second is an operational issue. When you think about this refiner who is having a difficult time finding enough crude oil for his refinery, what allocation controls tend to do for at least a short period of time—and this short period of time may extend into months—is they do not make more oil available to him. They make less oil available to him by restricting the distribution system through the allocation channels that the Government has set up where oil is going to go. And it's difficult for the large oil companies that you have mentioned to reallocate supplies to him if the Government has control over all those supplies and says, "No. You can't send it to this refiner. You have to send it to this farmer." And the refiner ends up going to the spot market anyhow.

We saw the big runup in spot market prices during the last interruptions when we also had price controls and we also had allocations. The refiner will have an easier time getting supplies for his refinery if he can go to anybody and compete for it on the same basis that they are competing, and they don't have the Government protecting them and protecting their supplies.

Senator DURENBERGER. Well, I think maybe we disagree on two points or I am not following you clearly. No.1, we are not talking about controlling the price of refined products. And, second, we hope, at least, that we are not talking about an allocation system that is imposed after the fact. In other words, it is a system in which the regulatory authority and so forth is delegated to the President with a check from the Congress that is done in advance of any kind of a short fall. So the market knows what is going to happen. And is is not just price controls or a controlled price they are reacting to, the whole element here is the sharing.

And it seems to me the system, at least to a degree, if it knows the ground rules, can adjust to the sharing that will be required as long as they know what those rules are in the event of a shortfall.

Do you disagree with that?

Mr. HOGAN. I don't think that we can plan in advance to the detail of knowing exactly who has excess oil and who has deficit oil under this system. So that's something that has to be done during the interruption. It cannot be planned in advance because we don't have the information today as to who is going to be interrupted.

The second problem is that under the systems that we designed in the past, there was no incentive for the people who have the surplus oil to provide it for the people who have the deficit, because they are forced to do so at these control prices. This has been the experience of the past. I can recall that the principal spokesmen for eliminating price controls and allocations have typically been the people in the Federal Energy Administration and later the Department of Energy who had responsibility for administering them, who saw exactly what the difficulties were in knowing in Washington what everybody needed everywhere. They just couldn't handle

the administrative difficulties. We will see this repeated if we have another interruption and we impose price controls.

Senator DURENBERGER. I disagree with you on that. I am sorry I have got to leave.

Senator BRADLEY. You mean you are saying that the farmers and fishermen didn't actually get the oil that they thought they were going to get?

Mr. HOGAN. The farmers and fishermen were probably more successful than some of the people who went to the spot market. I don't know who they are and it is hard to identify in advance. But people go to the spot market because they don't have better alternatives.

The allocation program—if they are a friend of Government and identified as important—will help them. But that, by definition, means that there is somebody who has been identified as not a friend and not important and they are then driven away and they can't compete. And they go to the spot market.

Senator WALLOP. Excuse me one second. The chairman would like the right for the other members of the subcommittee to submit their questions in writing to the members of this panel and other witnesses, which I am sure will be all right with this panel. I will mention that with regard to the other witnesses. I do have some others for the other three witnesses, but I won't be able to come back.

Senator BRADLEY. Let me ask him while you are still here, a question about the fear in Minnesota or Idaho or wherever it is viewed as the end of the pipeline that somehow or another they will be stuck with no product—I would like you to address that.

Second, I would like you to address the issue of why would the price differential in Minnesota in the wake of a disruption with no price controls—the price differential being higher than it is today?

Mr. HOGAN. Well, my forecast is that it would not be any, the differential.

Senator BRADLEY. Why?

Mr. HOGAN. Because there would be strong incentive for anyone who had—let's suppose there was a differential and differential used to be $0.10 a gallon. And now for some reason because of the supply interruption it goes to $0.20. Well, that means that I can buy the gasoline in Chicago and ship it to Minnesota and make $0.10 a gallon because it costs presumably $0.10 to move it there. That would explain the old differential. So I can get Senator Long to cooperate in this business venture as well, and we could succeed in making a big profit. And there are lots of actors out there who will see the same opportunity. Any such dramatic changes won't last very long. That's the basic theory of the market response.

Senator BRADLEY. Is there any reason to believe that the product won't get there?

Mr. HOGAN. I can't see any. Of course, I can certainly manufacture reasons. But it's hard for me to believe that those conditions are more likely to take place in a market response than they are likely to take place in Government allocations because I don't see that the Government has more information available. They cer-

tainly don't have anymore incentives than the people who could make the money there.

And in most of these markets—I can't think of any example offhand where you have such a monopoly situation that there is only one company that can supply. And they are then going to extract some kind of ransom.

One of the reasons it's hard to believe that is because if they could do it during an interruption, why don't they do it during normal time.

And so I see everything that you can think of as a difficulty associated with the market response, is a difficulty which also translates and probably is worse under price controls and allocations.

Senator BRADLEY. Well, I think that we have covered this territory pretty well. And I appreciate your willingness to testify before the committee.

Mr. HOGAN. Thank you, Senator.

Senator BRADLEY. I would like for Mr. Fry and Mr. Hubbard to submit for the record, unless it is already contained in your testimony, the relative effects of recycling versus price controls during a severe disruption; effect on economic growth, unemployment, and inflation.

[The information follows:]

PREPARED STATEMENT OF ROBERT C. FRY, JR., AND R. GLENN HUBBARD

THE ECONOMIC ADVANTAGES OF THE BRADLEY-PERCY PROPOSAL OVER ALTERNATIVE POLICY RESPONSES TO OIL SUPPLY INTERRUPTIONS

We would like to take this opportunity to present some qualitative and empirical support for the Bradley-Percy proposal (S.1354) to use market pricing of oil during a disruption in conjunction with the implementation of a revenue-recycling scheme to address the equity aspects of the problems caused by oil supply disruptions. We find that a proposal like S.1354 is likely to better serve the national economic interest in the event of a large oil supply interruption than would alternatives of "doing nothing" or controlling oil prices.

The venerable phrase "ceteris paribus" dots the musings of economists, though other things are seldom equal. Much of the policy analysis done by economists has focussed on static experiments in which variables such as oil prices were considered exogenous to the economy; feedback effects and interdependence among markets have been ignored. In truth, policies frequently do not work as planned, because we often ignore some of the channels through which the policies may affect the economy.

One lesson which we have learned the hard way is that our economy is very sensitive to changes in oil prices. Increases in the price of oil directly and immediately affect the general price level. They also divert spending from home-produced goods to imports, increasing the wealth transfer to oil producing countries and reducing the aggregate demand for U.S. output. Domestically, there is a transfer of income from consumers of oil to producers of oil. The rise in the relative price of oil, an important input, reduces the profit-maximizing level of output for firms which use oil, necessitating a fall in real GNP from the supply side. This reduction in output reduces the demand for other inputs, such as labor and capital.

These direct aggregate demand and supply effects are magnified because our economic system is not perfectly flexible. Because of rigidities in the economy, particularly rigid nominal wages, unemployment of resources will result, and the economy will fail to attain its (already diminished) consumption and production possibilities. The failure of wages and prices to adjust downward aggravates and renders permanent the rise in the price level caused by an oil price increase. The ultimate consequences for inflation and GNP will depend on the magnitude and timing of the oil price increase, on the effect of the consequent price level increase on wage settlements, and on the fiscal, monetary, and regulatory responses of the

government. All of these linkages are discussed in detail in Hubbard and Fry, "The Macroeconomic Impacts of Oil Supply Disruptions."

Given the economic costs of oil supply interruptions, we are faced with three policy choices: (1) do nothing; (2) impose price and allocation controls; or (3) let the market price oil while using the fiscal (tax and spending) system to address the equity imbalances occasioned by the disruption.

DO-NOTHING ALTERNATIVE

To "do nothing" does not imply a neutral effect of government policy on the economy. Windfall profit tax revenues would balloon during a large oil supply disruption, causing a substantial fiscal drag on the economy. An oil supply disruption during 1982 which raises the world price of oil by 30 percent would raise windfall profit tax revenues in 1982 to nearly $34 billion, roughly $13 billion more than the current estimate by the Congressional Budget Office of windfall profit tax revenue for 1982.

APPROACH OF CRUDE OIL PRICE CONTROLS

With large oil price increases yielding such a devastating effect on the economy, the political temptation to control domestic crude oil prices has been overwhelming. Though oil price controls have been rejected by the vast majority of economists, the expiration of the old Emergency Petroleum Allocation Act of 1973 (EPAA) has led to new attempts to extend the authority to impose price and allocation controls (for example, S1503).

Proponents of crude oil price controls argue that controls help to insulate the economy from the effects of oil price shocks by lowering the average price of a barrel of oil and by preventing holders of domestic oil reserves from reaping a windfall from a foreign price increase. Inflation

should be lower and real incomes higher under oil price controls than they would be without them, they maintain. Concomitant allocation controls are justified on the basis that certain groups in society have special needs for oil.

There are many problems with the maintenance of price allocation controls.

Domestic Supply. Opponents of controls have often countered that the cap inhibits the economic viability of looking for and producing more oil. If controls were lifted, the increased supply of oil would help to lower the oil price. It is likely, though, (as we will later discuss) that even if supply is completely unresponsive to the price of oil, controls may fail to accomplish their purpose. Indeed, the controls may have cost us dearly in the past.

An excellent survey of the economics of crude oil price regulation can be found in Kalt, The Economics and Politics of Oil Price Regulation, pp. 69-102. Kalt concludes that the impact of price controls on the time path of extraction from existing oil reserves is a priori ambiguous, but that price controls unambiguously discourage exploration and development of new supply sources.

Distortion of Investment. EPAA-like systems of price controls on domestically produced crude oil illustrate the government's ability to reduce private investment in particular industries by regulation as well as to distort the distribution of available supplies. Since petroleum and natural gas are among the most capital-intensive industries in the United States, the aggregate demand for capital may be reduced through the imposition of price controls as investment is diverted to less capital-intensive sectors. Since crude oil prices were decontrolled, there has been a dramatic increase

in investment in the oil industry.

Demand-side Effects. The most potent of the effects of oil price controls on the economy occur on the demand side. The U.S. is a major consumer of oil, consuming its own domestic production of 8.6 million barrels of oil per day and importing another 5.2 million barrels of oil per day. As long as the marginal barrel of oil is imported, changes in U.S. oil demand, whether from changes in domestic economic performance or from changes in the price of oil faced by U.S. consumers, can have a significant impact on world oil prices. For a more detailed discussion of links between the U.S. economy and the world oil market, see Hubbard and Fry, "The Macroeconomic Impacts of Oil Supply Disruptions."

Under domestic price controls, the average price of oil is a weighted average of a lower controlled price and a higher "world" price. The lower average price faced by U.S. buyers of oil and oil products stimulates U.S. oil demand and U.S. oil imports, putting upward pressure on the world price of oil. The resulting increased oil import bill reduces GNP. Though the price controls may restrain inflation in the short run, in the long run they may increase inflation because of the higher world oil price. To the extent that there is a positive domestic supply response to decontrolling oil, the case against price controls becomes stronger.

To mitigate the short run effects of an oil supply interruption, we need substantial stocks of oil inventories. Yet price controls discourage private stockpiling. As firms optimally plan their level of inventories, we know that the higher is the expected price next period (relative to that today), the higher will be the inventory levels (since profits are made on increasingly valuable inventories). Price controls lower the path of expected future prices as seen by the firm. Hence, the existence of price

and allocation controls may dampen the incentive for private companies to hold larger speculative or strategic stockpiles, thereby reducing our supply cushion in the event of a disruption.

While the oil price controls try to minimize the inflationary shock to the economy from a sharp runup in oil prices, their medium-run effects reduce real income through their negative effect on the trade balance and through multiplier effects on consumption and investment. These macroeconomic effects extend beyond the microeconomic inefficiency caused by controls, inefficiency that often takes the form of reduced leisure or added inconvenience, rather than of GNP losses and unemployment.

There are also international effects to be considered. Not only do price controls send a signal to our partners in the International Energy Agency that the U.S. is not serious about dealing with the oil crisis, but to the extent that U.S. price controls raise world oil prices, our allies (most of whom import a larger fraction of their oil than do we) are harmed as well.

MARKET PRICING WITH REVENUE RECYCLING

The final policy choice for dealing with an oil supply disruption is to let the market price and allocate oil and to use proceeds from increased federal and state tax revenues (from the Crude Oil Windfall Profit Tax and severance taxes) to supplement the [fallen] incomes of those most adversely affected by the oil price shock. The Bradley-Percy bill (S.1354) is a well-formulated embodiment of this approach.

The virtues of market pricing of oil have been extolled by many, ourselves included. In implementing a proposal like the Bradley-Percy bill, some important questions of feasibility must be answered.

When does a "severe petroleum supply disruption" exist? To discuss the implementation of a revenue-recycling program, we would have to have some mechanism, some "trigger," for determining when the program would commence. Such a trigger is provided for explicitly in the Bradley-Percy bill.

> "The term 'severe petroleum supply disruption' means a reduction in the volume of oil available to the world oil market which the President determines--
> (A) is the primary cause or is likely to be the primary cause of a 30 percent increase in the world price of petroleum products over a three-month period; and
> (B) is having or can reasonably be expected to have a major adverse effect on public health, safety, or welfare, or the national economy. A severe petroleum supply disruption exists only as long as the world price of petroleum products remains above the pre-disruption level or the volume of oil available to the world oil market remains below the predisruption level, but in any case no longer than six months without an additional determination by the President."
>
> S.1354, Section 3

Unfortunately, a disruption which could potentially have "a major adverse effect on public health, safety, or welfare, or the national economy," might not be sufficient to "pull" the trigger and activate the revenue-recycling program. This is largely due to the use of "the world price of petroleum products" as a trigger. Because of long-term contracts, OPEC contract price behavior, and other market rigidities, the average "world price" or petroleum and petroleum products adjusts relatively slowly to conditions in the world oil market, such as disruptions. For example, simulations using our model of the U.S. economy and world oil market indicate that an oil supply disruption of 10 million barrels of oil per day (equivalent to the loss of Saudi production) would raise the world price of crude oil (which proxies for the world product price) by only 15.4 percent in the first quarter of the disruption. The price increase

would not approach 30 percent until the second quarter into the disruption.

The case for using the crude oil spot market price as a trigger is overwhelming. First, spot price data is available in the very short run (through Platt's Oilgram, Petroleum Intelligence Weekly, etc.), while other measures are available only with a lag. Second, the spot price reacts to conditions in the oil market almost instantaneously, rather than with a considerable lag. Finally, for large disruptions, initial movements in the crude spot price anticipate upward movements in the world oil price, which may be more relevant, but less rapidly observable than the spot price. Our simulations indicate that a disruption of 10 million barrels per day would raise the spot price by over 40 percent during the first quarter of the disruption, quite a strong indicator of a "severe petroleum supply disruption."

Once we have decided upon a spot price trigger, we must have a means to determine the speed and magnitude of a price increase during a disruption. It may be very difficult to anticipate whether or not the price will rise by 30 percent in three months. Quantity data (to be used to help predict prices) is generally unavailable (or is of questionable accuracy) in the very short run. The best option may be to look at the behavior of the spot price over a much shorter interval than three months to aid in determining the potential severity of a disruption.

Even if the market is a more efficient allocator of oil than regulatory fiat, does the approach deal with any allocation problems that might arise? The Bradley-Percy bill provides for competitive sales from the Strategic Petroleum Reserve to ensure emergency access to crude oil for particularly affected refiners in lieu of a standby crude oil allocation program. The bill requires the President to submit procedures to make

possible successful bids for small volumes of Strategic Petroleum Reserve oil, such as bids from refiners serving agricultural or rural areas.

Will a revenue-recycling program be more costly to implement than price and allocation controls? The administrative costs of revenue-recycling programs are often cited as a reason to avoid the Bradley-Percy route. Professor Joseph Kalt of Harvard University has argued in testimony before the Senate Energy Committee (Congressional Record, October 29, 1981, p. S.12529) that "the average annual burden of EPAA price and allocation regulations over its life has been about $35 million, a $35 million a year taxpayer burden. The public burden in the form of paperwork and redtape burdens and price increases ultimately to the consumer ranges in estimate anywhere between $650 million a year and $2.7 billion a year."

In contrast, a recent study by the Office of Oil Supply Security of the Department of Energy ("Mechanism for Recycling Federal Tax Revenues to Individuals and Households in the Event of a Sudden Increase in the Price of Oil," April, 1981) documented much smaller costs for rebating funds through rebates in: (1) social security; (2) federal income tax withholding or estimated taxes; (3) state administered programs; (4) unemployment insurance (UI); (5) food stamps; and (6) Aid to Families with Dependent Children (AFDC). Leadtime preimplementation and implementation could be completed within a quarter for income tax reduction and block grants to states.

How complete can coverage be for a revenue-recycling program? The vast majority of households in the United States are covered by the fiscal system, i.e., they pay taxes and/or receive benefits. The interesting question is not whether the income of most Americans can be touched through a recycling program, but whether such a program can be constructed to distribute the burden of the disruption across the direct petroleum responses

of different groups.

By properly using the income tax withholding system, the social security system, AFDC, and UI, fully 97.2 percent of the population can be reached without significant double coverage. The nominal size of rebates of course depends on the size of the disruption and the effective costs to various groups.

Another conduit for recycling funds during an oil supply interruption is the social insurance payroll tax system. Recall that one of the macroeconomic effects of a disruption is a reduction in the demand for labor. Since employer contributions in the form of social security and unemployment insurance taxes are part of the total compensation package, they are a direct cost of employing labor. The reduction in the effective compensation rate per employee will mitigate part of the reduction in labor demand.

Those tax channels also have an administrative advantage over employee-oriented rebates, since firms are less likely to balk at the extra paperwork to reduce their tax payments to the federal government as they might at altering withholding rates for employees. This relative ease in collection is not had at workers' expense, since aggregate employment may be higher with the compensation reduction. Note that the worker's take-home pay does not fall.

In trying to redress the economic costs of oil supply interruptions to different groups through revenue-recycling, the Bradley-Percy bill is more generally equitable than a price controls plan. The disadvantaged are specific beneficiaries of S.1354. To the extent that energy consumption rises with income, price controls subsidize the well-to-do relatively more than the poor. Using a price controls program to help the poor is like using a sledgehammer to crack a nut.

SOME EMPIRICAL EVIDENCE

To empirically test the effects of the three alternative policy responses, we have performed simulation exercises of our general equilibrium model of the U.S. economy and the world oil market (described in detail in our paper, "The Macroeconomic Impacts of Oil Supply Disruptions"). The model emphasizes energy-economy interactions and domestic economic linkages by connecting a model of the world oil market with a core macroeconometric model containing real and financial sectors. The model is specifically designed to examine the economic effects of oil supply interruptions. We will present simulations running from the fourth quarter of 1980 to the fourth quarter of 1982.

Our test case for the model is a disruption in the world oil market of ten million barrels of oil per day. Such a disruption scenario represents the loss of all Saudi Arabian production (excluding the Neutral Zone). Saudi production is assumed to be zero from the fourth quarter of 1980 through the third quarter of 1981. It then rises for the next four quarters before becoming endogenous again. Sizable drawdowns of private oil inventories and the Strategic Petroleum Reserve during the disruption and increased fill rates after the disruption are also assumed.

Table 1 reports simulation results for relevant oil prices and quantities under a do-nothing policy (that is, with no oil price controls and no revenue-recycling program). Table 2 reports results under the assumption that crude oil price controls of $34 per barrel are imposed at the onset of the disruption. Table 3 reports results under the assumption that a revenue-recycling program redistributes the incremental windfall profit tax revenues through tax reductions and increases in various transfer payment programs. (The "incremental" proceeds refer to the excess of windfall profit tax receipts under the postulated disruption over the receipts under a scenario representing the actual state of the world oil market. In keeping with the findings of the DOE study cited earlier, proceeds are assumed to be rebated with a one-quarter lag.)

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GLOSSARY

INFLATION	The four-quarter rate of change in the implicit price deflator of the gross national product, in percentage points
NETCON	Total non-U.S., free world consumption demand for crude oil, petroleum products, and natural gas liquids
PIMPOIL	The U.S. refiners' acquisition cost of imported crude oil, in dollars per barrel
PSPOT	The spot price of Mideast Light Crude Oil, in dollars per barrel
PWORLD	The marginal price of crude oil faced by uncontrolled oil producers, plus taxes and transportation to American refiners, in dollars per barrel
REALINC	U.S. gross national product in billions of 1972 U.S. dollars
UNEMPLOYMENT	Unemployment rate in percentage points
USCON	U.S. consumption demand for crude oil, petroleum products, and natural gas liquids

TABLE 1

NO OIL PRICE CONTROLS AND NO REVENUE-RECYCLING PROGRAM
(DO-NOTHING POLICY)

	PSPOT	PIMPOIL	PWORLD	USCON	NETCON	REALINC	INFLATION	UNEMPLOYMENT
1980:4	45.93	36.56	38.38	15990	30730	1504	8.9	7.5
1981:1	48.26	40.78	42.63	16040	31470	1523	8.9	7.4
1981:2	46.49	44.20	45.11	13680	27760	1527	8.8	7.4
1981:3	43.06	46.05	45.82	13320	27300	1530	8.7	7.5
1981:4	40.62	46.48	45.57	14190	29020	1523	8.6	7.9
1982:1	37.73	46.05	44.50	14620	29790	1522	8.4	8.4
1982:2	34.60	44.86	42.77	13100	26270	1531	8.1	8.7
1982:3	33.38	43.24	41.17	13400	26110	1543	7.8	8.8
1982:4	30.38	41.54	39.11	14990	28230	1548	7.4	9.0

TABLE 2

OIL PRICE CONTROLS

	PSPOT	PIMPOIL	PWORLD	USCON	NETCON	REALINC	INFLATION	UNEMPLOYMENT
1980:4	46.86	36.64	38.65	16120	30790	1504	8.9	7.5
1981:1	51.01	41.27	43.63	16410	31630	1520	8.8	7.5
1981:2	50.96	45.51	47.14	14180	28000	1516	8.5	7.6
1981:3	49.27	48.46	49.12	14020	27660	1518	8.3	7.8
1981:4	49.30	50.25	50.53	15020	29510	1510	8.2	8.3
1982:1	48.20	51.52	51.21	15450	30350	1509	8.1	8.7
1982:2	42.56	51.72	49.94	13790	26850	1520	7.9	9.0
1982.3	38.23	50.33	47.73	14010	26730	1535	7.7	9.1
1982:4	34.34	48.08	44.97	15490	28850	1542	7.5	9.2

TABLE 3

REVENUE-RECYCLING PROGRAM

	PSPOT	PIMPOIL	PWORLD	USCON	NETCON	REALINC	INFLATION	UNEMPLOYMENT
1980:4	45.93	36.56	38.38	15990	30730	1504	8.9	7.5
1981:1	48.26	40.78	42.63	16040	31470	1523	8.9	7.4
1981:2	46.49	44.20	45.11	13680	27760	1527	8.8	7.4
1981:3	43.08	46.05	45.83	13320	27300	1531	8.7	7.5
1981:4	40.68	46.49	45.60	14210	29030	1524	8.6	7.9
1982:1	37.84	46.08	44.55	14650	29800	1524	8.4	8.3
1982:2	34.64	44.91	42.82	13130	26280	1534	8.1	8.6
1982:3	33.29	43.27	41.18	13430	26140	1548	7.8	8.7
1982:4	30.28	41.54	39.08	15040	28260	1554	7.5	8.8

An examination of Tables 1 and 2 reveals that crude oil price controls significantly raise world oil prices. Indeed, PIMPOIL, the refiners' acquisition cost of crude oil, is fully 16% higher under price controls than under the market pricing regime by the end of 1982. The lower average price (to consumers) of oil under price controls raised U.S. oil consumption demand, USCON, raising oil imports. The increased price and quantity of oil imports reduced real income and raised unemployment. By the end of the interval, the overall rate of inflation is just as high under oil price controls as without them. Recall, that we assumed no effect on domestic oil supply of imposing crude oil price controls.

Looking at Table 3, we can see that a revenue-recycling program like the one described in the Bradley-Percy proposal bolstered real income without overheating oil demand. The unemployment rate is eventually lower under the recycling regime than under either the do-nothing or price controls regimes. In sum, in terms of both oil market and domestic economic indicators, the Bradley-Percy proposal appears to dominate the other alternatives.

CONCLUSION

If Congress determines that the impact of rising oil product prices on individuals with low incomes is so severe as to warrant remedial federal action, such action should be taken through income assistance programs, rather than programs to control and distort prices. Comparing the prices and allocation controls approach to S.1354, two main points stand out in the Bradley-Percy proposals: (1) avoidance of the shortages which accompany oil price controls; and (2) provision for direct income assistance in the event Congress determines such assistance is required as a matter of fairness. In sum, by combining the efficiency of market pricing and allocation of oil during a disruption with the equity of a well-designed revenue-recycling program to redress the losses to consumers makes the Bradley-Percy bill the most attractive available alternative for dealing with oil crises.

Senator BRADLEY. In an effort to get some interaction, let's make the three witnesses a panel. Mr. James Plummer, Electric Power Research Institute, Palo Alto; Mr. George Horwich, Purdue University; and James C. Rosapepe of Rosapepe Powers & Associates.

Welcome to the committee, gentlemen. And if you could summarize your testimony and submit the entire testimony to the record, I would appreciate it.

TESTIMONY OF JAMES L. PLUMMER, ELECTRIC POWER RESEARCH INSTITUTE, PALO ALTO, CALIF.

Mr. PLUMMER. Thank you, Senator Bradley. I will quickly summarize the written statement.

Let me begin by saying that my viewpoints are only my own and not those of the Electric Power Research Institute, where I am now, or QED Research, the firm which I will head at the beginning of January.

I am going to summarize some material out of a book called "Energy Vulnerability" which I completed recently with nine other authors. I'll be summarizing the comparison between the price controls and allocation approach, that is embodied in the McClure bill, S. 1503, and the Bradley-Percy approach of surcharge and recycling.

Senator BRADLEY. Let me say because of our time constraints, I am going to have to limit each of you to 5 minutes.

Mr. PLUMMER. Both approaches, of course, imply recycling. In the McClure bill, the recycling is done to consumers of refined products. Whereas, in the Bradley-Percy bill, the recycling is done through the tax system.

The weaknesses of price controls are many. Price controls, first of all, weaken the leadership role of the United States in the international energy system, and with our allies in the OECD and the International Energy Agency. Those allies have become increasingly vocal over the last few years about the effect which U.S. price controls and allocations were having in encouraging U.S. oil imports, and driving up the prices of oil that they have paid.

It's ironic that the United States aspires to a leadership role in that system, yet is in many ways the least faithful to the principles.

Price controls also create inefficiencies, vested interests, and bloated bureaucracies. I would strongly disagree with Senator Durenberger's characterization that refiners be they large or small, would have an easier time getting crude oil under a price controls and allocation system than they would under a free market.

Senator BRADLEY. Why would you disagree?

Mr. PLUMMER. Because some refiners may be under the impression that they will be more favored by a price controls and allocations system, but it essentially is a system of musical chairs in which someone has to wind up losing. And the losses faced by the loser will be greater than the gains by all the people scurrying for small favors.

Senator BRADLEY. Who was the loser in the last disruption?

Mr. PLUMMER. Losers were often people who paid the——

Senator BRADLEY. The most efficient refiner?

Mr. PLUMMER. Yes. Even within the context of price controls systems, I am shocked by the McClure bill because essentially what it does is take scissors and scotch tape and put together the old emergency petroleum allocation act without trying to learn at all from the literature, from the studies, from the hard experiences and mistakes that occurred throughout the history of that system.

It's shocking that Congress could go back to the original language and not modify it at all.

The position of the Reagan administration seems to be that no legislation would be preferable to the Bradley-Percy approach or the McClure approach. I think that is also a mistake in approach because I think in the context of an oil supply disruption when political pressures have built up strongly, there would be pressure to take away the entire windfall. And what we would wind up with would be a hasty price control and allocation system like the one in the McClure bill, or something even worse.

My prepared statement indicates the economic reasons why I favor the Bradley-Percy approach and why I think the McClure bill is really a shocking mistake, which doesn't learn at all from the mistakes of the past.

I favor the Bradley-Percy approach as a compromise between the Reagan administration's approach of doing nothing and the McClure bill approach.

Since Senator Bradley has indicated that he is quite open to suggestions as to approaches that might be in between his own compromise and the McClure bill, which is quite potentially disastrous, let me suggest one possibility. And I don't advocate this. It's not the best approach. I would only present it as a further political compromise that has better economic features than price controls.

That would be to add a surcharge of 10 or 15 percent to the windfall profits tax during an oil supply disruption. And use that money to specifically, visibly subsidize particular refined products, such as diesel oil, so that farmers, truckers would get the political relief that they would seek. You could also do the same with home heating oil.

The advantage to that sort of approach is that these subsidies would be explicit and visible and would be likely to disappear after the interruption. Indeed, if oil prices came down after the disruption which is probably more likely in future disruptions than the ones we have seen in the past, then the fund of money would be gone and the subsidies would be very likely to disappear.

Senator BRADLEY. Will your new book explore some of the problems with price controls and allocations?

Mr. PLUMMER. Yes. The chapter written by Professor Gilbert at the University of California goes into those in detail.

Senator BRADLEY. And also reflect on the recycling approach as an alternative?

Mr. PLUMMER. Yes.

Senator BRADLEY. Would you be so good to provide each U.S. Senator with a copy of your book? Is it possible that you could arrange for your publisher to send each Senator a copy of this book so I don't have to Xerox the whole book?

Mr. PLUMMER. I will relay your request to the publisher. And I feel confident that they will respond positively.

Senator BRADLEY. Good. All right.

[The prepared statement follows:]

ALTERNATIVE POLICIES FOR COPING WITH OIL SUPPLY DISRUPTIONS

JAMES L. PLUMMER*

TESTIMONY BEFORE THE
U. S. SENATE FINANCE SUBCOMMITTEE
ON ENERGY AND AGRICULTURAL TAXATION

DECEMBER 8, 1981

The most meaningful comparison for these hearings to focus on is the surcharge/recycle approach taken in the Bradley-Percy Bill (S. 1354) and the price control/allocations approach taken in the McClure Bill (S. 1503). These two approaches are compared and analyzed in a book entitled Energy Vulnerability which I have completed along with nine other authors, and which is forthcoming from Ballinger Publishing Company in January 1982.

Both approaches would succeed in soaking up all or most of the windfall gain that would otherwise flow to domestic oil producers during an oil supply disruption. In the case of the Bradley-Percy Bill, the windfall would be redistributed in tax reductions and grants to State governments. Under the McClure Bill, the windfall would be redistributed via lower prices paid by the consumers of refined oil products. So the most important difference between the two approaches is that under the Bradley-Percy Bill refined products would be priced at levels corresponding to world crude oil price levels, whereas under the McClure Bill refined products would be priced at lower levels corresponding to a weighted average of price-controlled domestic crude oil and uncontrolled crude oil imports. The lower price levels under the McClure approach amount to a subsidy which can cause enormous distortions and economic losses, both during disruption and in the years following the disruption.

Price controls weaken the leadership role of the U.S. in international energy policy:

Subsidizing crude oil and refined products below world price levels means that consumption of refined products is artificially higher than it would have been. These price control subsidies actually encourage crude oil imports at just the time when the U.S. would be obligated under the International Energy Agency agreement to dampen the level of crude oil imports. The crude oil price controls which the U.S. used from 1973 to early 1981 left us open to strong criticism from other I.E.A. countries that the U.S. was pampering itself with domestic crude oil price subsidies and

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higher crude oil import levels, and thus driving up the price of oil paid by other countries. This is hardly the desired position for a nation that claims a leadership role in international energy policy.

Price controls create inefficiencies, vested interests, and bloated bureaucracies:

Since the price control and allocation mechanisms described in the McClure Bill are virtually identical to the mechanisms existent under the now expired Emergency Petroleum Allocation Act (EPAA), we only need to look at the history of the last 8 years to see the disastrous effects of that approach. Huge errors were made in the allocation system, causing enormous market distortions and waste. Millions of people wasted time in gasoline lines. The Congress and Executive Branches became the targets of legal and illegal bribery attempts by those groups who were highly favored or disfavored by the system. Substantial amounts of uneconomic small refinery capacity was built in response to the special subsidized treatment they received under the system. Finally, armies of bureaucrats, lawyers, accountants, and consultants were diverted from more productive activity in order to run the system and defend the interests of each affected group. Whatever bureaucratic structure would be required to implement the Bradley-Percy approach would be small relative to the huge structure needed to run an EPAA system.

One of the worst aspects of price controls is the political difficulty in removing them after the disruption is over. The inefficiences and distortions are thus extended far beyond the period of disruption which invoked the use of price controls.

Adopting the same language as the old EPAA would be an admission that the Congress is incapable of learning from all the mistakes of the EPAA system. Even within the context of price control systems, there are other systems which could avoid some of those mistakes. I understand that, because the Administration position is that no legislation is needed in this area, the Department of Energy refused to provide any assistance to the staff of Senator McClure or the Senate Energy Committee. This posture of splendid detachment by the Administration may yield the worst of all worlds -- the repetition of all the mistakes of the EPAA system.

Price controls on crude oil alone may not succeed in holding down the prices of refined products:

What price controls on domestic crude oil production do is lower the domestic refinery acquisition cost for crude oil. One must then depend on competition among refineries and a lot of hope

to believe that those price reductions will be fully passed on in lower refined product prices. If the U.S. imports refined products from foreign refineries which are paying world crude oil price levels, then those refined product imports will come in at higher prices that reflect those world crude oil price levels. These higher priced refined product imports, if they are needed to satisfy total domestic demand for refined products, could drive up the price of some categories of domestic refined products. That would mean a widening of refiner profit margins and no price benefit to consumers. This kind of situation can force the price control bureaucracy to: (a) extend controls to domestic refined product prices, and/or (b) control imports of refined products. This is the quandry of all price control schemes -- either to admit ineffectiveness, or control an ever widening set of commodity prices.

The position of the Reagan Administration:

If, during the next disruption, the price of crude oil went from $34 per barrel to $60 per barrel, the windfall would be on the order of $60-70 billion per year. A lot of that would be soaked up by the existing Windfall Profits Tax, existing Federal and State corporate income taxes, and Federal and State royalty payments. Still, it is doubtful that the Congress would be able to withstand the pressures to soak up most or all of the remainder of the windfall. It seems likely that some hasty price controls system, like the one embodied in the McClure Bill, would result from such pressures.

The logic used by Senator McClure is just as puzzling as that of the Reagan Administration. He has argued that by giving the President permissive authority now for price controls in this bill, this would make it less likely that Congress would pass compulsory price control legislation during a disruption. What S. 1503 actually does is to quietly transfer to the Executive Branch the onus of someday having to publicly invoke and implement a price control system, while the bill still preserves the potential influence of some Congressional leaders over the details of price control implementation. Again, the history of Congressional roles in EPAA implementation is a good guide to probable future Congressional roles under a new EPAA system.

Disruption tariffs -- even worse than price controls:

Another approach to coping with oil supply disruptions is to impose a disruption tariff in order to try to dampen both world oil price levels and private sector oil inventory building. Unfortunately, a disruption tariff would achieve neither of these objectives.

If, by some form of political magic, the U.S. Congress agreed to politically self-distruct and enacted a unilateral disruption tariff, this would have only a slight impact on the world oil

price, and would not be worth the enormous macroeconomic damages that would be inflicted on the U.S. economy. These macroeconomic damages are analyzed thoroughly in Energy Vulnerability. Although a disruption tariff jointly imposed by he U.S., Japan, and West Germany would have some greater impact on the world oil price during a disruption, that benefit would still not be worth the macroeconomic losses it would inflict on those economies.

In the last few months, Phillip Verleger has argued for a disruption tariff on the basis that it would be very effective at discouraging domestic oil inventory building at the onset of a disruption. His analysis seems to be overly focused on the 1979 Iranian disruption, which was a very special situation in which inventories were quite low at the start of the disruption. The Verleger analysis also ignores the ability of oil companies to evade the impact of a disruption tariff by building offshore inventories. Moreover, the Verleger analysis seems to imply that private inventory speculation is bad, when in fact it probably has a positive impact in the long term.

Conclusion: The Bradley-Percy approach, or some variant of it, is a good compromise approach to a difficult problem:

The Bradley-Percy Bill is a compromise which is preferable to either the McClure Bill approach of extending EPAA now, or the Reagan Administration approach of doing nothing now and risking the enactment of a compulsory EPAA during a disruption.

Senator BRADLEY. Let's hear from Professor Horwich.

TESTIMONY OF GEORGE HORWICH, PURDUE UNIVERSITY, WEST LAFAYETTE, IND.

Mr. HORWICH. Thank you, Senator. I am Professor of Economics at Purdue University. I want to begin by saying that I concur with a great deal of what I have heard from the other witnesses and I am pleased to endorse what they have said insofar as they have expressed grave doubts about the efficiency and the equity of the price control and allocation system. The controls were seriously counterproductive during the turbulent energy cycles of the 1970's. They can only promise to be again.

The price ceilings on crude oil perversely raised the U.S. demand for imports and discouraged domestic production. The controls on petroleum products resulted in over-consumption and, in an economic sense, allocation to less-valued uses, scrambled and reduced service in the market for gasoline, and disincentives to refineries to produce a mix of products consistent with changing demands.

I don't think we need to repeat this experience. If, during a disruption, our goal is to minimize national economic distress, then we will let consumers do their own allocating at freely determined prices.

In general, those most willing to pay the higher prices will be those with the greatest economic stakes in acquiring fuel. Those who drive farthest to their jobs, meet the biggest payrolls, live in the coldest climates, attach the highest utility to driving, have the least postponable fuel-utilizing tasks, such as harvesting crops—they will tell us who they are.

European countries and Japan generally employed much looser and more flexible controls, and, as a result, experienced lower real costs during the oil crises than did the United States.

Those countries in which petroleum price ceilings were rigid and binding experienced a rapid disappearance of petroleum supplies that was quickly reversed when, and only when, the ceilings were removed.

The smaller geographic size of European countries and Japan and their nonadversary tradition of government-business relations militate toward a less rigid regulatory framework. However, the territorial vastness of the United States and its arms-length regulatory tradition make the use of free-market prices the only feasible way of allocating petroleum and minimizing economic distress under oil supply disruptions.

The use of price controls and coupon rationing during crises does not reduce the real cost of regulatory programs. Like all controls, coupon rationing merely transforms the cost into less visible forms, while increasing the costs.

The windfall profits tax, the corporate income tax, and State and local taxes promise to collect as much as $.75 of every additional dollar of oil industry revenues under a supply disruption. To a large extent, these revenues are automatically recycled to the public, even without specific Government measures. This is because the revenues tend to fund the large Government deficits with which we start this decade and which, in any case, will tend to appear following an oil disruption and the induced reduction in economic activity. However, some portion of the oil revenues should be specifically earmarked to alleviate economic hardship.

The United States should continue its rapid buildup of the Strategic Petroleum Reserve. We cannot count on private stockpiling under the deterrents we have fed the private sector through our price controls and allocations.

We should draw down the reserve through a competitive sealed bid, uniform price auction, which I think best approximates the free-market mechanism.

We should reconsider our commitment to the international energy sharing program, which does not specify a price at which supplies are to be exchanged, and which, I think, is a redundant program. The international tanker market, which is still quite competitive, has shown its ability several times to achieve proportionate distribution of oil supplies, even in the presence of embargoes. And I think the IEA does us a great disservice by militantly opposing spot-market trading.

Senator BRADLEY. Mr. Horwich, could I ask you a few questions; and why don't you submit the rest of your testimony to the record?

[The prepared statement follows:]

PREPARED STATEMENT OF PROF. GEORGE HORWICH AND PROF. BURTON D. MORGAN

GOVERNMENT CONTINGENCY PLANNING FOR OIL-SUPPLY DISRUPTIONS: LESSONS FROM THE /970s IN THE UNITED STATES AND ABROAD

George Horwich
Purdue University

SUMMARY

o The system of price-controls and mandatory allocations in the U.S. oil market during the 1970s was seriously counterproductive with respect to both efficiency and equity criteria. The suppression of free-market prices and allocation was particularly harmful during periods of oil-supply disruption.

o European countries and Japan generally employed much looser and more flexible controls and, as a result, experienced lower real costs during oil crises than did the United States. Those countries in which petroleum price-ceilings were rigid and binding experienced a rapid disappearance of petroleum supplies that was quickly reversed by removal of the ceilings.

o The smaller geographical size of European countries and Japan and their non-adversary tradition of government-business relations militate toward a less rigid regulatory framework. The territorial vastness of the United States and its arms-length regulatory tradition make the use of free-market prices the only feasible way of minimizing economic distress under oil-supply disruptions.

o The use of price controls and coupon rationing during oil crises does not reduce the real costs of regulatory programs.

o The willingness of most oil companies in Europe to trade in the spot market enabled them to fulfill mandated historical allocation patterns while responding to changed market conditions during disruption periods.

o An important factor in the success of West Germany in avoiding price controls was the distribution in November 1973 of a government document enunciating the case for free markets. A copy of that statement is attached to this report.

o The windfall-profits tax, corporate-income tax, and state-and-local oil taxes promise to collect 75 cents of every additional dollar of oil-industry revenues under a supply disruption. While these tax revenues will tend to be automatically recycled by funding the simultaneous government deficit, a specific allocation of revenues to alleviate economic hardship should be designed in advance.

o The U.S. should continue its aggressive build-up of the Strategic Petroleum Reserve. The expectation, even if unfounded, of price ceilings and mandatory allocations in any future oil disruption serves to deter private stockpiling.

o Specific strategies for triggering use of the Strategic Petroleum Reserve should be devised as soon as possible. Drawdown of the reserve should be carried out by a competitive sealed-bid uniform-price auction.

o The United States should reconsider its commitment to the sharing program of the International Energy Agency (IEA). The program is designed to offset, through sharing of supplies at a price as yet unspecified, the impact of any selective oil embargo against a member country. But it is likely that international market forces will overcome any embargo, as they did the embargoes against the United States and the Netherlands in 1973-74, far more rapidly than will the IEA. The IEA is also militantly opposed to trading in spot markets during crises. Avoidance of such trading results in a loss of economic welfare.

o All major countries reacted to the general inflationary impact of oil-supply disruptions in the 1970s by reducing their monetary growth rate. This tended to exact a cost in additional loss of jobs and real GNP that far exceeded any benefit from a reduced inflation rate. Monetary authorities should, in fact, pursue slightly increased monetary growth rates following oil disruptions. Such a policy will counter any temporary deflationary tendencies in non-petroleum markets due to massive spillover of funds into petroleum-company and government coffers.

o A tariff of $5-$7 per barrel on imported oil, levied during a nondisrupted period, would have the desirable effect of transferring substantial revenues from OPEC producers to the United States. The resulting higher price of oil would also more accurately reflect the higher costs of the unstable foreign supply.

o The disastrous oil price and allocation controls of the 1970s can be avoided in future disruptions only by carefully planning to do so, as through enactment of the Bradley-Percy bill.

I. INTRODUCTION

There is wide consensus that the system of price controls and allocations in U.S. energy markets in the 1970s was not effective, either in terms of efficiency or equity criteria. The price ceilings of crude oil perversely raised U.S. demand for imports and discouraged domestic production. The controls on petroleum products resulted in overconsumption, allocation to less-valued uses, scramble and reduced service in the market for gasoline, and disincentives to refineries to produce a mix of products consistent with changing demands. From the viewpoint of equity, there is little evidence that the poor fared better than the nonpoor, and that the controlled allocation of energy resources produced a distribution of income that was more equitable--by any standards--than the distribution resulting from a completely unregulated energy market.

In spite of these facts, on which there is widespread agreement, there remains a general reluctance to commit the nation to a free-market response in the event of a future disruption to world oil supplies. The prevailing belief is that while unregulated markets work adequately in normal, nondisrupted circumstances, government controls are necessary to guide energy markets through a supply disruption; only direct government allocations can guarantee the movement of remaining supplies to their most important uses; and only government-mandated price ceilings can minimize the cost of the disruption and prevent inequitable impacts on the poor and unjustified benefits to the oil industry.

I believe that recent history points to an opposite conclusion. Freely-determined market prices are the most-efficient means of allocating energy and all other resources following a supply curtailment, as at any

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other time. No one, in or out of government, has the information or the capacity that the aggregate, decentralized market possesses for moving resources rapidly to their most valued uses, reducing energy consumption, finding substitute sources of energy supply, and limiting thereby the loss of jobs, the decline of GNP, and the increase in the rate of inflation. No agency, including the Department of Energy, can possibly acquire and process the enormous amount of information that is transmitted routinely through nationally-determined unregulated prices.

It is, moreover, a fallacy to suppose that price-ceilings can reduce the higher real cost of oil caused by a supply disruption. The major effect of price controls is to convert the higher cost into even higher, though less immediately visible, alternative forms.

On the issue of equity, there is overwhelming consensus among economists that equity is best served by diverting to low-income individuals some portion of the windfall-profits and other taxes, which promise, under disruptions, to capture 75 percent of any increase in oil-industry revenues in this decade. In fact, whether diverted to the poor or not, these revenues are inevitable, and policy as to their disposition in supply shortfalls must be formulated.

This is the lesson of the 1970s, not only for the United States, but also for our Western allies and Japan, most of whom, surprisingly, relied more on market mechanisms and succeeded better than we in cushioning their more vulnerable economies from the effects of oil-supply disruptions. The experience of our allies is particularly relevant since, in the short run, at least, they are probably less dependent on changing price signals than are we. In the European and Japanese economies, nonprice communication is more feasible since industries tend to be more concentrated

and populations much more geographically dense and immobile. Yet the energy regulations imposed by the other major OECD countries were generally far less rigid than ours and far more responsive to the changed prices and general energy environment.

There was also an absence abroad of the adversary relationship that seems inevitably to characterize the interaction between regulators and the business community in the United States. On a recent visit to the major European capitals and energy ministries, I did not meet a single government representative who, at some point in our conversation, did not hasten to remind me that he was not an expert in the production or distribution of petroleum products, the final decisions on which are best left to those in the petroleum business. To this American economist, an erstwhile member of the staff of the Office of Oil Policy in the U.S. Department of Energy, this official attitude was not only refreshing, positive, and realistic, but, outside of a narrow band of trusted colleagues, utterly without precedent in his domestic experience.

II. THE MARKET MECHANISM

An assessment of the damage caused by price and allocation controls can be grasped most readily by considering briefly how resources are allocated in an unregulated market.

In the retail gasoline market, for example, several hundred thousand service stations, several thousand distributors (including pipelines, trucks, rail tank cars, and river barges), and some three hundred refineries throughout the country and in Eastern Canada and the Caribbean are linked together by a network of prices. If California experiences an increase of population and an increase in gasoline demand, the slightest upward pressure on gasoline prices--1 or 2 cents a gallon--will draw gasoline

from distributors elsewhere in the country with the speed of a computer. The 1 or 2-cent price increase represents an increase in profit margins, and distributors throughout the continental United States will not be tardy in learning about it or responding to it. While the movement of gasoline by the market into California will wipe out the price differential, the temporary gain in profits is nonetheless worth having.

Eventually a more permanent, least-cost routing of gasoline directly from distribution sites within California will be established. If the increase in demand represents a net increase in the total demand of the country, operators farther up the production chain, including refiners and producers and importers of crude oil, wil soon learn, through reflected price movements, that more of their product is wanted. The mechanism at each stage is basically the same. At the refinery level, the price of gasoline--regular, premium, leaded, or unleaded, as the case may be--rises and provides refineries with a profit incentive to increase the production of the desired product.

III. U.S. PETROLEUM-PRODUCT PRICE CONTROLS

Throughout the post-embargo control period, from 1973 to 1981, prices in the U.S. refined-product market were not rigidly fixed, but were allowed to rise to absorb increases in the cost of crude oil. There were, of course, periodic increases in the price of imported oil, as well as permitted gradual increases in several categories of domestically produced crude oil. But so-called "nonproduct" costs--those of labor and capital equipment--could be passed through to price at only a limited rate. Since the times were inflationary, particularly during oil crises, the limitations on cost passthrough tended to keep product prices below market-clearing levels.

To compound the rigidity, the Department of Energy (and its predecessor agencies) placed strict limits on profit margins, both at the refinery and retail level. This destroyed the basic mechanism of the distribution process, preventing prices from rising in response to increases in demand. Variable prices and profit margins were, of course, particularly missed under conditions of crisis and rapid change.

During the noncrisis periods between 1974 and early 1979 and during much of 1980, the petroleum-product industry functioned under the regulations at less than maximum efficiency. Nonproduct costs were gradually passed through to prices, which approached and frequently reached market-clearing levels. In the gasoline retail market, however, ceiling prices became market-clearing prices only when station owners reduced the quality and hours of service, thereby eliminating the labor costs that could not be passed through.

At the refinery level, inflexible cost-passthrough regulations and frozen profit margins prevented refiners from altering their equipment to process the changing grades of oil that were appearing in the world market, and from altering their mix of products in the direction of the increasingly desired no-lead gasoline. The so-called "tilt" rule, which allowed refiners to pass through the higher cost of producing no-lead, corrected the situation, but only after a bureaucratic lag of six years.

When ceiling prices are binding, one possible response is that the unsatisfied demand will spill over into energy substitutes whose prices are controlled less rigidly or not at all. The prices of the substitutes are thus higher than they would have been in a completely uncontrolled market, and the net effect of the price ceiling on the average level of all energy prices may be negligible. This happened in the case of crude

oil, where unsatisfied demand at the controlled domestic prices was converted into a greater demand for crude-oil imports. Both the quantity and price of imports rose as a result of the substitution.

In the gasoline market, when the ceilings fell below market-clearing levels during periods of petroleum curtailments and sharply rising crude-oil prices, there were responses on both sides of the market. On the supply side, as we have just seen, there was a deterioration in the quality of the product--reduced hours and service. On the demand side, there are no close substitutes for gasoline in the short run, and the unsatisfied demand for the original product was converted into more intensive search activity, waiting, and general scramble and inconvenience, all of which entail a loss of valuable time from both work and leisure. As onerous as higher prices might be, the added upward pressure on the prices of imperfect substitutes, the loss of product quality, and general scramble are not very attractive alternatives. When the shortfall is allocated by higher prices, the greater payments made by consumers are received by someone, who gains (and can, of course, be taxed). Under product deterioration and scramble, there are no gainers, only losers. It is wishful thinking to suppose that the poor, who are more frequently the old, the young, and--by definition--those with relatively few resources, do well in this kind of competition.

With long lines forming at service stations during crisis periods, station owners resorted to limitations on the number of gallons sold to each buyer, preference for established customers, and other ad hoc allocation rules. Several states or regions mandated weekend closings and alternate-day eligibility for gasoline purchases based on whether the last digit of the license number was odd or even. The general effect of

these diverse allocation and regulatory methods was to destroy the certainty of supply that normally characterizes the gasoline and diesel market. Travelers could no longer venture far from home, and shippers could no longer consign freight, confident that at some price, fuel could always be obtained. The result was a general depressing effect on all activities that depended on the operation of the fuel distribution system.

IV. COUPON RATIONING

The proposal is frequently made that price ceilings in the gasoline market be combined with coupon rationing to avoid the uncertainty and the scramble. But coupon rationing has serious drawbacks. The claim that it is "fair" is superficial. An allocation of coupons on any objective criteria, such as an equal number to all families or to all vehicles, ignores the vast differences between people in their desire and ability to respond to the increased scarcity of supply. To suggest that a central authority can design an allocation that will be generally perceived as fair and reasonable is thus unrealistic. Who can possibly know who among us has the greatest desire or capacity to drive less? Is it poor migrant workers, who must travel to survive? Or busy suburban housewives, who may be able or willing to curtail some of their driving chores, but not all, without incurring unacceptable costs? Or vacationers, who may be planning a once-a-year trip?

If our goal is to minimize the loss of jobs, GNP, and social welfare, there are no known (or knowable) administrative rules that can be employed to allocate gasoline or decide how much of any petroleum shortfall should come out of gasoline in the first place. The common public policy of placing the greater burden of an oil disruption on automobile driving is not, in fact, defensible with reference either to the maintenance of GNP

or the efficient use of energy. The allocations of the 1970s, which curtailed driving and recreational activities disproportionately, caused severe distress and unemployment in tourism and related industries, in which many Americans earn their living. Moreover, there may be many more immediate opportunities to economize in home heating (thermostats can be turned down, rooms closed off, and heavier clothing worn) than in transportation. And air travel, which soared during the crises, is more energy-intensive on a per-passenger-mile basis than are our least fuel-efficient automobiles.

If minimizing national economic distress during disruptions is our goal, we will let consumers do their own allocating at freely-determined prices. In general, those most willing to pay the higher prices will be those with the greatest economic stake in securing fuel--those who drive farthest to their jobs, meet the biggest payrolls, live in the coldest climate, attach the highest utility to driving--they will tell us who they are. If we are concerned about the poor, we should provide direct cash subsidies to them out of existing windfall-tax revenues without resorting to price ceilings and allocations that exacerbate the loss of jobs and GNP and help (or harm) the poor and nonpoor alike. If it is oil (and other) industry profits we wish to limit, we should rely on a system of taxes and rebates and avoid rigid controls that fix prices, freeze profit margins, and destroy the very mechanism by which the market economy operates.

It is often suggested that a legal resale market for coupons would enable those with stronger driving desires to express that demand. But this results in an arbitrary transfer of income from those who drive more to those who drive less. It is not clear to what degree that income

transfer will help the less affluent more than the more affluent.

And all coupon rationing programs suffer from nightmarish bureaucratic and administrative costs and implementation lags that make them of doubtful value under any circumstances, particularly those of the limited time horizon of an energy crisis.

Finally, while coupon rationing will allocate the demand, it does nothing to compensate for the dampening effect that the price ceilings have on supply and on the holding of inventories.

V. U.S. ALLOCATION REGULATIONS

The primary allocation system actually used by government in the 1970s at the petroleum-product wholesale and producing levels and in special setasides of gasoline to the states was to distribute supplies according to the pattern of sales and purchases of an earlier period. The U.S. is a country of vast size and a high degree of personal mobility, however, and the 1972 base-period use pattern was already outmoded by the fall of 1973 when 1972 became the reference period. Fast-growing states, such as Florida and California, were allocated less than the proportionate share they had received just prior to the 1973 Embargo. When the Iranian crisis struck in May 1979, the comparable month of 1972 was still the official base period. The Energy Department quickly substituted October 1978 as the new reference date for allocations. But this involved a serious seasonal distortion, resulting in inadequate gasoline supplies in vacation sites in June 1979. In July, when the Department reversed itself once again and increased allocations to rural and resort areas, the public had already cancelled its vacation plans and decided to stay home. The shortages in Washington and other major cities were severe--many times greater than the net shortfall of oil in

the world market--while gasoline on the New Jersey shore and the rural Midwest went begging.

Political influence also played a role, as it often does when nonprice allocation is used. Farmers, a powerful lobby, typically were supplied a quantity of oil products equal to their entire pre-interruption consumption level. They were frequently observed reselling it. The governor of California, a political rival of the president, came to Washington and carried off a sizable supplemental allocation for his state.

VI. U.S. CRUDE-OIL PRICE CONTROLS

The price controls in the raw-material or crude-oil market were a combination of ingenuity and unintended perversity unmatched in the annals of regulation. We had, of course, no ability to restrain the price of imported oil directly, but, as part of the 1973 Phase III wage and price ceilings in force, domestic oil prices were already controlled. In a short time several categories of ceilings were imposed: a low price of $5.03 a barrel for oil already in production as of May 1973--dubbed "old," and later, "lower-tier" oil--and the world price for oil newly produced after May 1973, a ceiling that was lowered after December 1975. Small stripper-well production (less than 10 barrels per day) was exempted from controls.

One equity problem in these differential price ceilings was that refineries with access to the cheaper old oil had an advantage over those that had to rely on imports. Congress soon rectified this by devising the entitlements program under which all refiners, through a system of cash transfers at the end of each month, would end up paying the same price for oil--the average of domestic and foreign--no matter what the actual mix of purchases. Small refiners were given an especially generous allotment, known appropriately as the "small refiner bias," under which

they received more than their proportionate share of the old oil price.

This averaging, entitlements scheme was the part that was ingenious. The part that was perverse, which went unnoticed at first, was that by creating a common average price for all oil--imported and domestic--imported oil sold at less than its actual price--it was subsidized--and domestic oil sold at more than its actual price--it was taxed. When this program was implemented in 1975, imports of oil increased dramatically above the level that could be attributed to the rising economy of 1975-76. It is no coincidence that when the oil controls were phased out, beginning in April 1979 and ending in January 1981 with the swift final decontrol, imports of oil dropped as dramatically as they had earlier increased.

VII. EUROPEAN PRICE CONTROLS

While direct comparisons need to be qualified, the fact remains that most of Europe and Japan responded far more flexibly and efficaciously than did the United States to the oil-supply disruptions of the 1970s. In 1973-74, all of Europe and Japan were net importers of oil, producing little or no crude oil domestically. By the end of the decade, only Britain and Norway were significant producers. The general tendency for European countries and Japan was thus to accept the sharply rising price of crude oil that began in 1973 as unavoidable. As one economist remarked, only half in jest, these countries were fortunate in not having any domestic crude oil, the producers of which could be held responsible and punished for the rise in prices by a whole panoply of controls and allocations.

At the refined product level, however, all major countries instituted regulations of some variety in an effort to moderate the price increases and/or influence allocation. During the Embargo period, two countries,

Sweden and the Netherlands, instituted a system of price controls and gasoline rationing, but only for brief periods. In both cases, motorists crossed the borders into neighboring countries, where, at higher prices and without coupons, they could buy all the gasoline they wanted. The controls were soon abandoned. Fuel prices generally rose throughout Europe, and, with the exception of sporadic Sunday closings, were permitted to reach market-clearing levels under flexible government interventions.

Only in the United States, with its strictly enforced system of refined-product controls, did nationwide gasoline queues continue throughout the Embargo. Significantly, the queues preceded the Embargo, first appearing during the summers of 1972 and 1973 under the general wage and price controls dating from August 1971. The Embargo, which was accompanied by a reduction in the world supply of oil beginning in October 1973, raised market-clearing product prices and exacerbated, but did not initiate, the U.S. gasoline shortages and queues. And while the Embargo ended in March 1974, the gasoline queues in the United States disappeared only with the lifting of general controls and the attainment of market-clearing gasoline prices in May 1974.

The supply disruption in the spring and summer of 1979 created circumstances similar to those of 1973-1974 in the United States and other OECD members. Only the U.S., among major countries, maintained stringent controls and experienced severe localized shortages and gasoline queues throughout the crisis period. In Britain, gasoline price-increases at this time were subject to ratification by a price commission. And while all requests were eventually approved, the commission moved slowly, allowing ceiling prices to fall below market-clearing levels, particularly in England and Ireland. In May 1979, the new conservative government

took office and abolished the commission, ending at once the fuel shortages and the queues.

Price controls in Sweden in the early spring of 1979 caused rapid disappearance in whole categories of petroleum-product supplies. The Swedish government took the unusual step of asking the International Energy Agency (IEA) to trigger the agency's petroleum sharing program. Although Sweden's supplies had fallen below the official 7-percent trigger mark, the IEA voted not to implement sharing and recommended instead that Sweden draw down its petroleum inventories and relax its controls. Having little choice, Sweden lifted its price ceilings and soon experienced a restoration of supply.

Italy also imposed binding price ceilings and, as supplies dwindled, made informal inquiries of the IEA as to possible sharing. They too were advised to remove their price controls, which they did, with the same positive supply effects.

While prices were eventually allowed to reach market-clearing levels during crises in all OECD countries except the United States, only West Germany, Switzerland, and, after May 1979, Britain unabashedly pursued free and unregulated petroleum price policies. Countries typically employed complicated formulae limiting the increase in product prices to increases in the cost of crude oil and other inputs. Unlike the United States, however, these formulae usually left room for a margin of error and, in most cases, did not freeze profit margins. Denmark, for example, allowed refineries an 8 percent markup over their raw material and production costs. This proved to be adequate in the circumstances.

As a result of flexibility in product pricing, prices in Europe and Japan could vary regionally within the country in response to

differences in the supply and demand balance. The available petroleum supply was thereby drawn to its most valued uses.

VIII. EUROPEAN ALLOCATION REGULATIONS

Allocation regulations were also established in all European countries, but again, with far less bureaucratic exactitude than prevailed in the United States. The general rule or guideline was that oil traders and refineries should supply their customers during disruptions in proportion to year-earlier consumption levels. In both Britain and Germany, the larger oil companies were also strongly advised to share supplies with smaller oil companies whose survival was viewed as important to the future competitiveness of the market. Companies complied with this request and failures of small oil companies were few, if any. The government of Denmark made no such appeals and many small importers did not survive the crises.

Oil ministers in Britain and Germany pointed out to me that it was possible to call together in one moderately-sized room all the major ministry officials and representatives of companies that serviced 80 percent of the national petroleum market. The density of population, moreover, far exceeds that of the American continent. Both Britain and West Germany are approximately the size of the state of Oregon. There are 53 million Britons, 62 million West Germans, and only 2 million Oregonians. Similar comparisons can be made for the other countries of Western Europe, none of which is geographically as large as our larger Western states. These circumstances of limited numbers in the bureaucracy and industry, highly concentrated populations, and a perception by government of its role as an intermediary, coordinator, and facilitator, rather than a litigious adversary, all combined to pull Europe and Japan

through the oil crises with far less friction and market breakdown than occurred in the United States. Despite the formal allocative strictures, European companies retained a great deal of latitude in making exceptions to the historical-allocation rule. Newcomers to industry were accommodated. Regional shifts of population and commerce, though small by American standards, were taken account of. And perhaps, most important, no government took an active stand against trading by the oil companies in the spot market. With the exception of the international Esso companies, which avoided spot purchases of crude oil, the companies of Europe and Japan traded vigorously in the spot market as long as product-price controls permitted passthrough of the petroleum costs thus incurred. In this way companies supplemented their petroleum supplies and achieved a reasonable balance between the official goal of maintaining historical consumption-ratios throughout industry and making what the oil companies regarded as appropriate exceptions in view of changes in the environment.

IX. CONCLUSIONS

This brief survey of American and OECD regulatory experience under oil-supply disruptions implies that the optimal response is that of the free market. This is not to say that the costs of disruption under market responses will be low, only that the costs will be lower than under a system of price ceilings and centralized allocation. Under price controls and allocations, the additional costs take the form of higher prices of uncontrolled goods, added search time and inconvenience in finding controlled goods, and the loss of incentives to increase the supply of goods in short supply and reduce the demand for such goods in economically efficient ways.

There are, of course, political and equity considerations that make unmodified market solutions untenable. As a practical matter, the citizenry need assurances that their government is closely monitoring the market response to supply disruptions and that government possesses and can rapidly implement regulatory tools should a consensus later call for their use. In this sense Germany, and, to a lesser extent, Britain, probably forged the most successful political-economic approaches to the oil crises of the 1970s. Germany imposed no price controls and Britain did so sporadically and loosely. Both allowed oil companies latitude in meeting historical-use consumption patterns. While the German government's insistence that large oil companies share supplies with small ones is almost certainly economically indefensible, the economic costs of this policy are minor compared to those of a typical regulatory program. One very fruitful measure undertaken by the German government early in the crisis of 1973 was the circulation of a statement by the Economics Ministry setting forth the advantages of avoiding price controls. The statement, which was widely circulated, appears in translation at the conclusion of this paper.

For the United States, the economic and political considerations are different. As a major producer of oil, windfalls to domestic producers are a recurring political issue. The oil windfall-profits tax (actually an excise tax) enacted in 1980 is certainly a substantial response--from an economic perspective, perhaps too substantial--to this equity concern. The problem of recycling the revenues under the tax will not arise as long as the federal budget remains in deficit. In a severe oil disruption, however, the deficit could be exceeded by the increase in tax revenues. The disposition of the possible surplus is thus a problem that must be faced whether the Bradley-Percy bill is enacted or not.

The United States cannot and, in my opinion, should not try to emulate the collegial relationship between many European governments and industry representatives. The fewness of both bureaucrats and companies and the geographical smallness of the latter countries foster a close relationship and lend a desired flexibility to the regulatory framework. But U.S. traditions and geography are quite different. The U.S. is geographically vast, its industries tend to be much less concentrated than those of Europe, and the adversary relationship between government regulators and industry is a fact of life. As such, communication is best left to the impersonal mechanisms of the market, particularly since prices are so effective--over the greatest distances--in allocating resources efficiently.

A leading complementary weapon to free markets in the response to oil disruptions is, of course, the use of oil stockpiles. The past record of U.S. controls and allocations, however, does not augur well for private stockpiling. Speculative holders are motivated by the propsect of future windfalls. By their action they perform the socially useful function of transferring supplies from normal to disrupted periods, dampening the future price increases. But stockpiling is an expensive activity, particularly at today's high interest rates, and is surely rendered less attractive by the prospect that the U.S. government might again impose price ceilings and mandatory allocations in any future disruption.

Even passage of the Bradley-Percy bill is unlikely to dispel all doubts as to future regulatory intervention. Indeed, it is impossible for this Administration or this Congress to commit all future governments to a policy of non-intervention. As such, the aggressive development of the Strategic Petroleum Reserve is one of the most positive contingency energy policies that government can and should continue to pursue.

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It is essential that specific strategies for drawdown of the reserve be devised as soon as possible. Once the drawdown decision is made, the oil should be sold competitively in a sealed-bid uniform-price auction. Experimental evidence supports an auction in which there is a single, uniform price as one that most nearly approximates the determination of price and quantity in the competitive marketplace.

The United States must also decide in the near future the depth of its commitment to the IEA sharing program (the IEP). Established after the 1973-74 Embargo, the IEP, to which all OECD countries except France are signatories, is a means of re-allocating oil supplies so as effectively to offset a selective embargo against any of its members. The program is triggered under an oil-supply curtailment of 7 percent or more to any individual country or to the group as a whole. There is no specification of the price at which supplies are to be transferred, and, indeed, member countries thus far have been unable to agree on whether that price shall be at market--spot or contract--or below.

The goal of countering a selective embargo by cooperative action is a worthy one, but superfluous in the light of recent history. The Arab OPEC embargo against the United States and the Netherlands was ineffective. When oil from Saudi Arabia and other Arab producers was diverted from the United States, other oil--from Iran, Venezuela, and sources unknown--replaced it. The process was not a charitable one, but rather the outcome of natural market forces designed to equalize the price of oil exports throughout the world. As long as the United States received less than its proportionate share of the reduced world supply in 1973-74, the price of oil imports in the U.S. exceeded the world level and acted as a magnet drawing supplies from non-Arab sources.

The IEP sharing formula very closely approximates the market-determined distribution. But the IEP is unlikely to be implemented with anything near the speed that market forces will bring to bear against selective embargoes. The administrative procedure of triggering the program and agreeing to a transfer price are inevitably time consuming. On this practical level, IEA membership thus seems to offer few benefits.

There is also the danger that even in the absence of an embargo, the fact that any oil-supply curtailment initially strikes countries differentially will trigger the sharing mechanism. IEA, with its nonmarket, unspecified-price allocation procedures, would thus automatically occupy center stage in the international adjustment process. This could prove to be incompatible, or, at best, difficult to reconcile with internal free-market responses.

Another decidedly negative aspect of IEA is its official and unyielding opposition to trading in the spot market. Supply disruptions tend, of course, to drive spot prices above contract prices. The IEA position is that any spillover of purchases into the spot market will, through OPEC reactions, push both spot and contract prices to a permanently higher level.

While many, if not most, governments and industry people publicly subscribe to this notion, the U.S. Department of Energy was particularly vocal and, I believe, effective in discouraging spot-market trading by companies operating in the United States. The result was a loss of supplies that might have overcome allocative rigidities during crisis periods.

The analytical foundations of the IEA position have never been explained. In any market, price is determined by aggregate supply and

demand. Since contract prices are necessarily sticky in the short term, changes in supply and demand tend to exert their initial impact on spot-market prices and quantities. The spot market is thus a barometer to market-watchers, including suppliers, and an extremely important safety-valve to traders who need to adjust their oil-holdings without delay.

To OPEC, a rise in spot prices is a signal that profits are to be made by increasing output, which has the ultimate effect of reducing the spot price and limiting any upward pressure on contract prices. If the increase in spot prices reflects a supply disruption, there is thus no social gain in discouraging demanders from implementing their own profit-maximizing purchases. If these purchases are of an ongoing character, prohibiting them will result in some marginally lower price in the future, but oil output will also be lower. Like any forced allocation rule, the prevention of spot-market trading results in a loss of social welfare and economic efficiency.

There are three final points that I believe are relevant to contingency planning. With regard to aggregate stabilization policy, all OECD countries reacted to the oil disruptions of the 1970s with a tightening of the money supply. Since oil disruptions tend to cause an increase in the general price level, this is an understandable reaction. But it is a mistaken policy. The inflation due to oil-supply disruptions is caused by the higher cost and reduced supply of an important input in production processes. The general inflation materializes when the aggregate supply of output falls, leaving fewer goods to be exchanged against an unchanged rate of monetary spending. A reduction of the money supply in these circumstances would have no tendency to limit the higher price of oil, which is set in world markets, and would reduce the general price level

while incurring disproportionate additional losses of total output and employment.

Moreover, under the disruption, the likely huge increase in revenues to the oil industry and the government (via tax payments) may entail some temporary slowdown in spending in non-petroleum markets. A somewhat easier monetary policy in this event would compensate for any possible decrease in such spending and tend to sustain, not increase, prices in the non-petroleum sectors of the economy. The policy would have the beneficial net effect of also sustaining employment and output in those sectors.

It is difficult to know, in an actual disruption, whether an increase in money, as opposed to constant monetary growth, is the preferred policy. I would urge the authorities to err on the side of slightly easier money. The potential benefits in sustained employment and output far outweigh, in my opinion, the costs of a possible extra small burst of monetary-induced inflation.

Serious consideration should also be given to the imposition of a tariff of $5-$7 per barrel on petroleum imports. Every economist who has investigated this option comes away deeply impressed by the substantial transfer of revenues from OPEC to the United States that such a tariff generates. The tariff can also be justified as raising the price of oil to a level that more accurately reflects the cost created by the instability of imported supplies.

I do not think it is advisable, however, to impose such a tariff during a disruption period. Anything, including a tariff, that raises oil prices further will add significantly to the costs already incurred. The suggestion, frequently made, that other IEA countries might join us

in levying such a tariff, thereby increasing the likelihood that the world price of oil itself will immediately fall, is unrealistic. Other IEA nations already tax their petroleum products far more than we do and are not likely to share our enthusiasm for further taxes.

Nevertheless, gradually phasing in such a tariff during nondisrupted periods is a policy that could yield significant long-run benefits.

Finally, I think it is clear to all who have lived through the turbulent energy cycles of the 1970s that in the absence of an announced official policy, as proposed in the Bradley-Percy bill, controls in the wake of a future oil-supply disruption will be imposed with the speed of lightning--by Congress, if not the Administration. Neither the United States nor its allies, including the countries of the third world, have anything to gain from this outcome. There is evidence, in fact, that U.S. controls and regulations in both its oil and natural gas industries contributed as much to the higher energy prices of the 1970s as any other single force, including the Arab OPEC restriction, the fall of Iran, and the Iran-Iraq war. We should therefore carefully plan to rely on market responses in the future. This can only be done by a deliberate legislative act, as by passage of Bradley-Percy, and by Administration promotional efforts similar to those undertaken by the Federal Republic of Germany in the attached manifesto.

APPENDIX: REPORT OF THE ECONOMICS MINISTRY OF THE FEDERAL REPUBLIC OF GERMANY

Report of Nov. 16 and 17, 1973

re: Ceiling Price Regulations for Energy

During its session of Nov. 16 and 17, 1973, the science advisory counsel for economics at the Federal Ministry dealt with the problems of "ceiling price regulations for energy" and reached the following conclusion:

The law for securing energy supply in case of endangerment of oil or natural gas imports (energy security law) of Nov. 10, 1973, authorizes the Federal Government, among other things, ". . . to fix ceiling prices for natural oil and oil products; for solid, liquid, and gaseous combustibles; and for electrical energy, as well as for other energies and energy carriers (goods)" (paragraph 1, section 1). From the history of the law one can see that this authorization serves the purpose of avoiding excessive prices in case of a pronounced disturbance in supply and demand. A guideline of the European Common Market puts the member nations under the obligation to issue, if necessary, price regulations in cases of an oil-supply crisis, in the interest of a common energy policy.

Public opinion is widespread that ceiling-price regulations are a particularly effective means for ensuring the best possible supply in case of a severe shortage; furthermore, they are recommended to fight inflation. The economic and social effects related to such ceiling-price regulations, in particular the long-term and side effects, are ignored in this connection.

This has prompted the advisory counsel to deal with the problem of such ceiling-price regulations for energy:

1. Each price intervention alters the consumption and the production of the products in question, and in the long run, also the related investment decisions. By controlling ceiling prices, the demand for the scarce product is generally not reduced, the supply is not increased, and substitutes and investments necessary for alleviating the shortage are not stimulated. In this way, an excess demand is created and steadily increased.

2. Contrary to a widespread belief, according to which energy consumption is on the whole, price insensitive, experience shows that increasing prices reduce consumption of certain types of energy somewhat--in certain circumstances, even considerably. In this way, energy consumption, in part, is reduced overall (energy conservation), and in part is changed in its composition, the cheaper energy replacing the more expensive one (energy substitution). Ceiling-price regulations for energy encourage energy waste and inhibit energy substitution for alleviating the shortage.

3. Through an increase in energy prices, one also counteracts a shortage in energy supply, even in the short term. If, in a country or an economic zone (e.g., the European Common Market), a price increase is prevented, the realizable profits for energy are thereby limited and the supply is reduced. This is true in the short term for oil, natural gas, and coal. Thus, even with constant world supply, the relative attractiveness to foreign suppliers of a market area without controlled ceiling prices would increase. In fact, however, one can count, even in the short term, on a stimulating effect on production at home and abroad, because individual producers react to price increases by stepping up their supply.

4. When the oil-supply shortage extends over a longer period, the expected short-term reactions to rising energy prices are further supported by parallel investments. As far as the ultimate energy users are concerned, this may have the following consequences: conversion of heating systems, improved insulation of buildings, restructuring of traffic (means of transportation and traffic systems); as to energy converters (power plants): a change in operating energy and related investments; as to producers of primary energy: a faster development of capacities.

5. In order to achieve uniform adjustments, the government, undertaking a multitude of interventions, would have to interfere with energy consumption, energy conversion, and energy supply, partly in a limiting and partly in a stimulating or otherwise regulating manner. In view of the known inherent shortcomings of a planned restructuring of economic activity through administrative interventions, it will be preferable, by any means, to choose a market-economic solution and thereby keep the drawbacks involved as small as possible. Among these drawbacks are especially undesirable distribution effects due to shortage-related price increases (see point 7).

In the face of the uncertainty, especially as to how long and how intensely the present oil shortage is to continue, it is a particular advantage of a market-economic solution that, due to the great number of decentralized decisions, the overall economic effect of incorrect decisions remains lower, and the capability of adjustment is greater than under a centralized, and therefore necessarily uniform, assessment of future developments.

6. Ceiling prices cancel the distribution function of the market. They lead to forms of distribution which, above all, disadvantage the socially weak consumer. Therefore, they soon provoke a system of public allotments to consumers (rationing). This rationing has, according to all experience, prevented adjustment processes of the type described above, and has led to a hardening of production and consumption patterns. Also, the implementation and supervision of rationing requires the employment of economic resources which could be put to more productive use in a market-economic solution.

Renunciation of ceiling prices and rationing to end-consumers does not exclude other control measures for limiting and restructuring energy consumption. To these belong specific bans on usage, such as no driving on Sundays and holidays, speed limits and no lighting, as well as special delivery regulations for those energy consumers who must take on additional

duties within the framework of the necessary readjustments (e.g., public transportation). It is true that these measures also represent market interventions, but are preferable to price ceilings and rationing because they leave the price mechanism on the energy market otherwise untouched; nevertheless, one must be aware of the fact that they also may have undesirable side effects on other economic activity (e.g., on tourism in resort areas).

7. Any shortage of vital products inevitably affects the distribution of real income. Ceiling prices are therefore often justified as protecting socially weak groups and economically weak producers. Opposed to this argument is the fact that the distribution effects of ceiling prices and end consumer rationing cannot be unequivocally accounted for, and that, furthermore, any such regulation must be mechanical, and therefore unfair, because it cannot take into account the diverse situations of the ones involved. It is also true that rising energy prices within a market-economic solution can lead to socio-politically undesirable burdens for households and businesses. These burdens can be alleviated, however, by well-orchestrated financial aids without interfering with the effectiveness of the price system.

8. Extraordinary shortage of products can lead to an extraordinary increase in profits. So long as these profits are used for the expansion of supply, they serve to overcome the shortage. In addition, in the long run, profits normalize again. Considering the possible lack of competition in energy markets, there might still be an insufficient expansion of investments. In order to prevent this, the legal instruments for securing competition must be exhausted in a purposeful manner. In any case, ceiling prices are again an unsuitable means for the solution of these shortage-related problems.

Senator BRADLEY. I am curious about your recent trip to Europe. You met, I think, with a lot of Europeans on the issue of contingency planning. Is that correct?

Mr. HORWICH. Yes. I had a chance to meet the energy ministers or deputy ministers in the major capitals of Europe.

Senator BRADLEY. The Germans and the Swiss, and more recently the British, have come to rely more and more on market mechanisms to allocate supply in a disruption.

Mr. HORWICH. That's correct.

Senator BRADLEY. How is that possible? I mean how could they do that?

Mr. HORWICH. Well, Germany, of course, entered the 1970's with a commendable record of economic growth broadly attributed to the freedom of markets in that country beginning in the early postwar period. There was probably even a presumption that Germany might approach crises with the use of free-market allocations. However, to make sure of that, when the October 1973 oil disruption began, the economic ministry circulated a document, which was remarkably prescient and anticipatory of the problems of price controls, of rationing, of general market allocations, and pointed out what the losses would be from pursuing such a policy. This was given wide circulation. I have attempted, with assistance, to translate it, and attach it to my report as an appendix.

I think the lesson from this is that the Government needs to prepare people and to help them understand what the severe costs of market intervention are.

Senator BRADLEY. And what do you see as the usefulness or lack thereof of the International Energy Agency in planning any kind of international thing?

Mr. HORWICH. As I said, I think the IEA sharing plan is superfluous. It was set up primarily to offset the effects of a selective embargo against one of its member countries. And it does that essentially by reallocating supplies in a way in which the market would probably do, at least for disruptions that are not severer than any that we have thus far experienced.

But the fact of the matter is that the 1973 and 1974 embargo against the United States and the Netherlands was ineffective. The market reallocated. It did an excellent job and it will again.

I have grave doubts about allowing the International Energy Agency to play a central role in allocation, as it will tend to even in the absence of embargoes. No disruption is going to affect all countries proportionately in the first instance. The IEA will thus find itself center stage, reallocating supplies which I think are better left to market allocation.

Senator BRADLEY. Thank you very much.

TESTIMONY OF JAMES C. ROSAPEPE, ROSAPEPE, POWERS & ASSOCIATES, WASHINGTON, D.C.

Senator BRADLEY. I would like to hear now from Mr. Rosapepe.

Mr. ROSAPEPE. Thank you, Mr. Chairman. I am James C. Rosapepe, partner in the public policy consulting firm of Rosapepe, Powers & Associates. My practice focuses, primarily, on tax and energy issues.

Earlier this year, I served as a member of the National Petroleum Council's Committee on Emergency Preparedness.

Senator BRADLEY. Mr. Rosapepe, I am very sorry. I am going to have to leave.

Mr. ROSAPEPE. I hope it was nothing I said.

Senator BRADLEY. No, no. [Laughter.]

If you would like to submit your testimony for the record, I think that that would be acceptable. If you wanted to wait 15 minutes, I would come back and hear it. It is your choice.

Mr. ROSAPEPE. I, frankly, would appreciate the chance to share some thoughts with you.

Senator BRADLEY. Fine. I will be back in 10 minutes.

[Whereupon, at 11:24 a.m., the hearing was recessed.]

AFTER RECESS

Senator BRADLEY. The subcommittee will come to order.

Mr. Rosapepe, do you want to take 5 or 10 minutes and make your statement and tell me what you wanted to say?

Mr. ROSAPEPE. Thank you very much, Mr. Chairman. I appreciate you coming back to hear me.

I realize the focus of this hearing is on the tax related provisions of S. 1354, but I can't resist the temptation to make a brief comment on the trigger provision of the bill.

It seems to me the bill takes a big step in the right direction, relying primarily on a price trigger rather than a traditional volume trigger. While I would want to focus more on the spot, rather than contract, price markets, I commend you for avoiding the pitfalls of trying to evaluate the need for Government intervention on the base of what I think is unavailable information about future supply

shortfalls. If you believe in the market, then you ought to look at price to figure out whether you have a crisis. And I think that is a big step in the right direction.

As to the centerpiece of the bill on recycling, everything we have heard this morning seems to me indicates that much of the appeal of recycling comes from the perceived problems of price and allocations controls and the expected problems with a "free market" approach. In a sense, allocation is denounced as a creation of Rube Goldberg and the "free market" approach is dependent on a Peter Pan-like leap of faith.

Recycling with marketing pricing is seen as a middle way. My view is that recycling combines the worse aspects of both Rube Goldberg and Peter Pan.

We need to keep in mind the potential scale of revenue transfers involved. Consider a disruption that would cause a 6-month, 20-percent shortfall, looking just at gasoline consumption of 6 million barrels a day.

With short-term elasticity of gasoline demand of minus 0.1, the before-tax increase in oil industry revenue would be over $400 billion. You project that over other kinds of oil products, you can easily get up to a trillion-dollar transfer. I think in real life it isn't going to be that large, but you could easily be talking about hundreds of billions of dollars in extra revenue.

To minimize economic disruption, your recycling plan has to (1) capture almost all the increase in oil prices; (2) return the revenue to consumers quickly; and (3) assure, at some level of confidence, that the money goes to the right consumers, those whose need is greatest. That's a tall order. And I see some problems with the bill as drafted.

First, a major increase and expansion of the windfall profits tax would be needed. Even using oil industry estimates, the Government captures at most—the Federal Government—70 to 75 percent of increased prices from domestic crude oil.

If the total increase in oil company revenues were $200 billion, that would leave around $50 million in industry bank accounts unavailable for recycling. Allowing the oil companies to withdraw that much money—an annual of $100 billion—from its normal uses in the economy could create serious recessionary pressures, cause significant hardship to consumers, and certainly inflame public resentment of oil industry profiteering during the shortage. But the problem is much worse than that.

The claim that the Government would capture even 72 percent or 70 or 75 percent of the windfall—ignores first, increased margins in refining and marketing. And Senator Wallop referred to margins earned on foreign transactions. It ignores higher prices for oil substitutes such as market-priced coal and natural gas. And it ignores the effect of tax shelters such as the depletion allowance, foreign tax credits, section 482 abuses, and, indeed, even the new leasing provisions, all of which essentially reduce the effective tax rate on the oil companies.

The recylcing plan must capture much more of the redistributed income than the Federal Government would under current law. Unfortunately, for proponents of recycling, the closer the revenue yield comes to 100 percent of the price increases, the less incentive there is for the companies to respond efficiently.

Second, a better way must be found to get the money back to consumers quickly. The ICF study done for the Department of Energy said that the best option, the quickest option, including reducing income tax withholding rates, using social security, block grants, et cetera, would take 3 to 4 months to put into effect. The discussion this morning—Emil Sunley says maybe we can do it in 30 days. You get billions of dollars taken out of the economy before your plan was in effect.

Third, in some way the recycled revenue must be matched to consumers who are most burdened by oil price increases. The methods considered in the bill basically take money on the basis of oil dependence and distribute it on the basis of which lists are handy in Washington, D.C. Such a mismatch could create unnecessary hardships for certain, almost randomly chosen consumers and create an enormous potential for fraud and abuse. We all know that, in welfare and food stamps, very small numbers in the fraud area or in the misallocation area create tremendous concern in Congress. The numbers would be much bigger here.

And, third, it would misallocate resources.

I am forced to conclude—this is in the paper and I won't go on right now—that while I don't advocate it, those problems make gasoline rationing with a white market look a lot better. And I know one of the issues you are interested in, Senator, is the comparison to different approaches. It seems to me that when you have rationing with a white market, you take out a number of the steps. You get the money moved around to consumers using a market, the exchange of coupons. You capture almost all the short short-term increase in prices through whatever price the market puts on those coupons. And you get more money to the right people.

[The prepared statement follows:]

Statement of James C. Rosapepe

Public Member of Committee on Emergency Preparedness

of National Petroleum Council

Summary of Major Points

1. By requiring a "price," rather than a "volume," trigger to initiate government intervention in the case of an oil supply disruption, S.1354 significantly improves on other emergency preparedness plans.

2. Recycling windfall revenue increases caused by market pricing during a disruption has significant problems:

   - o the amounts of money to be recycled could be enormous -- in the hundreds of billions of dollars;
   - o current tax laws will capture too small a fraction of the windfall;
   - o the recycling mechanisms proposed in the bill -- reduction of income tax withholding, increases in Social Security payments, etc. -- are much too slow;
   - o these recycling methods will not efficiently match money with needs.

3. The bill's proposed Windfall Profit and other tax breaks for oil discovery, storage and inventory drawdown are unlikely to be cost-effective. A "hoarders' tax" would be more efficient.

Mr Chairman and Members of the Subcommittee:

I am James C. Rosapepe, a partner in the public policy consulting firm of Rosapepe, Powers, and Associates. Most of my own practice is focused on tax and energy issues. Our clients include both public and private sector organizations, but my testimony today reflects strictly my own views.

In 1980 and the early part of this year, I served as a public member of the National Petroleum Council's (NPC) Committee on Emergency Preparedness. As a member of the Committee, I took a particular interest in tax-based policies for managing an oil import cutoff. I am pleased to share with the Subcommittee some observations on this subject.

While I realize the focus of this hearing is the tax-related provisions of S.1354, I can't resist the temptation to make a brief comment first on the "trigger" provision of the bill. This was one of the most hotly debated issues in the NPC Committee.

S.1354 takes a major step in the right direction by proposing a "price" trigger (a 20% hike in world oil prices over 3 months), rather than the traditional "volume" trigger. While I would want to focus the trigger on spot, rather than contract, prices, I commend the sponsors of the bill because it avoids the pitfalls of trying to evaluate the need for government intervention on the basis of unobtainable information about future supply shortfalls. If you believe in the relative efficiency of market mechanisms, you must hold increases in world spot prices are a relatively good gauge of current and prospective supply problems.

Recycling

Now, on to the core of the bill -- recycling of Windfall Profit and other tax revenue increases during an energy emergency.

As Senator Bradley (D, N.J.) pointed out when he introduced S.1354, much of the appeal of recycling windfall revenues comes from the perceived problems with the old price control and allocation system and the expected problems that a "pure" market-oriented policy would create. In a sense, with allocation denounced as a creation of Rube Goldberg and with the so-called "free market" approach dependent on a Peter Pan-like leap of faith, market pricing with recycling is seen as a reasonable middle way. Its proponents hope it will provide efficiency with equity.

Unfortunately, I fear that recycling combines the worst aspects of both Rube Goldberg and Peter Pan. And that it will provide neither efficiency nor equity.

To understand why this is so, it's important to keep in mind the potential scale of revenue transfers involved. Consider a disruption that would cause a six-month, 20% shortfall from current gasoline consumption of 6 MM/BD. If the short-term elasticity of gasoline demand is -.10 (as the NPC report suggests), the before-tax increase in oil industry revenue would be $459 billion.

Adding in similar figures for other oil products, the total redistribution of income to the oil industry from consumers and other industries could top 1 trillion dollars![1]

Even in the more likely case that the redistribution is only in the hundreds of billions of dollars, the importance of capturing those windfalls and recycling them effectively is clear. To minimize economic disruption, a recycling plan must:

- o capture almost all the increase in oil prices;
- o return the revenues to consumers quickly;
- o assure that money goes to the "right" consumers -- those whose needs are greatest.

That's a tall order. And one that S.1354 as drafted does not meet. Here are some of the problems I see:

1. A major increase and expansion of the Windfall Profits Tax would be needed.

Even using oil industry estimates, the federal government captures at most 72% of increased prices for domestic crude oil.[2] That means that at best less than 3/4 of the income redistribution will be available for recycling.

If the total increase in oil company revenues were $200 billion, that would leave at least $56 billion in industry bank accounts, unavailable for recycling. Allowing the oil companies to withdraw that much money (an annual rate of $112 billion) from its normal uses in the economy could:

- o create serious recessionary pressures;
- o cause significant hardship to consumers;
- o inflame public resentment of oil industry profiteering during the shortage.

But the problem is much worse than that. The claim that the government would capture even 72% of the windfall ignores:

- o increased margins in refining and marketing;
- o higher prices for oil substitutes such as market-priced coal and natural gas;
- o the effect of tax shelters such as the depletion allowance, the foreign tax credit combined with Section 482 abuses, and the new "leasing" provisions.

To avoid creating a recession, consumer hardship, and public anger, the recycling plan must capture much more of the redistributed income than the federal government would under current law. Unfortunately for proponents of recycling, the closer the revenue yield comes to 100% of the price increases, the less incentive there is for the companies to respond efficiently.

2. A better way must be found to get the money back to consumers quickly.

Since the magnitudes of money involved could be so enormous, the recycling must be accomplished almost instantaneously. Otherwise, even if the money is finally returned, aggregate demand will have been needlessly depressed and middle and low income families will have been needlessly penalized.

The proposed recycling mechanisms mentioned in the bill -- block grants, increases in Social Security and SSI payments, and reduction in income tax withholding -- do not hold much promise for assuring prompt return of the windfall revenues. ICF, Inc., a Department of Energy consultant that reviewed these recycling options, concluded that, among them, the withholding tax/block grant option "could be implemented the quickest, in about 90-120 days."[3/]

In the context of multibillion dollar income redistributions, 3 - 4 months is not quick enough!

ICF also noted that "the most serious disadvantage of this option is that it would be very difficult to implement a tax cut during the period September through December without prior warning. To do so would cause a severe disruption of the tax system."[4/]

I don't have any better ideas for recycling mechanisms, but it's clear that those mentioned in the bill can't do the job.

3. In some way, recycled revenue must be matched to consumers who are most burdened by oil price increases.

Some of the macroeconomic danger inherent in rapid oil price increases could be dealt with by taking the federal government's share and mailing it out, in checks of equal amounts, to every postal patron in America. Somebody would get the money and, on average, spend about 95% of it and save the rest.

That's not a bad description of what the recycling mechanisms proposed in S.1354 would do. None of them -- income tax withholding, SSI, block grants -- bear any necessary relationship to patterns of energy consumption. Money would be taken from consumers according to their oil dependence and returned according to which lists are handy in Washington, D.C.

Such a mismatch would:

- o create unnecessary hardship for certain, randomly chosen income and regional groups, businesses, and individuals;
- o create enormous potential for fraud and abuse;
- o reduce economic growth by misallocating resources.

The only way to really minimize these problems is to return the money in some way that is proportionate to oil use. But the only effective way I can think of to do that is to leave the money in the consumers hands to begin with!

These are of the sorts of difficulties that lead me to conclude that Rube Goldberg and Peter Pan can feel comfortable with recycling. And that raises the question of whether or not, in a severe shortage in which tools such as the Strategic Petroleum Reserve are inadequate, gasoline rationing with a "white market" is not superior on efficiency grounds to market pricing with recycling.

Unlike recycling, rationing with a "white market" would:

- o capture almost all the short-term increase in oil prices (with obvious macroeconomic, equity, and political benefits);
- o return the money to consumers almost immediately (since the recycling would take place through market exchanges of ration coupons);
- o get money to the "right" people (because drivers and car owners are more readily identifiable and reachable than other oil users).

All of this is not to endorse rationing, but simply to suggest that market pricing with recycling is not clearly more efficient than rationing with a "white market." Indeed, recycling is probably more cumbersome and more risky.

Windfall Profits Tax

S.1354 also suggests consideration of reductions of the Crude Oil Windfall Profit Tax on oil "discovered during and after the severe supply disruption" and on oil "stored prior to the disruption." (Title I - Section 101(f)).

I see two sets of problems with these options.

First, it is difficult to see how either of them would be cost-effective methods of providing greater supplies during a shortage. Like all such tax expenditures, they would give money to taxpayers for certain activities whether or not they would have undertaken those activities anyway. Thus we are likely to be paying $2 for $1 worth of new production or inventory.

Second, why do we want to give tax breaks for discovering oil during an emergency? During the disruption, we want increased production, not discoveries. Given the lead time generally required to develop oil wells, it is unlikely that oil discovered during a shortage would be available in significant quantities until the crisis is over. The NPC report, in contrast, identifies specific regulatory roadblocks, particularly at the state level, that need to be removed if we are serious about increased oil production during a cutoff.[5/]

Oil Storage Tax Incentives

Similar questions are raised by Title III - Section 301 of the bill which calls for a study of new tax breaks for drawdown of private inventories and of "tax or other incentives" for construction and maintenance of private oil storage facilities. If such studies are undertaken, they should focus rigorous attention on the cost-effectiveness of paying oil companies (and others) to do things they'll do anyway. I suspect that it

would be cheaper for the American taxpayer to invest more in the SPR or in a decentralized, publicly-controlled system similar to Germany's Oil Storage Association (EBV) than to throw more tax dollars at the oil companies.

A more promising approach may be to enact a "hoarders' tax" to encourage oil companies to drawdown their stocks during shortages. In contrast to tax breaks for companies that do drawdown inventories, a "hoarders' tax" on those that do not would be:

- o cheaper (it would raise government revenue, not spend it);
- o more efficient (no company would get a subsidy for what it would have done in any case);
- o more popular with the public (since oil companies would be penalized for "hoarding" rather than rewarded for doing what they should be doing anyway).

Mr. Chairman, thank you for the opportunity share my thoughts with you. I look forward to answering your questions.

Footnotes

1/ Oil, Chemical, and Atomic Workers International Union, Robert Goss, President, Staff Analysis of National Petroleum Council's Coordinating Subcommittee Draft Report on Emergency Preparedness, March 3, 1981, pp. 4 and 5.

2/ Distribution of Incremental Revenue Dollar from Crude Price Decontrol Oil Produced by Typical Integrated Corporation, 1980 - 1990 Average, chart prepared by Exxon Corporate Planning staff for NPC Coordinating Subcommittee on Emergency Preparedness, undated.

3/ Mechanisms for Recycling Federal Tax Revenues to Individuals and Households in the Event of a Sudden Increase in the Price of Oil, ICF, Incorporated, April, 1981, pp. 1-3.

4/ Ibid.

5/ Emergency Preparedness for Interruption of Petroleum Imports into the United States. A Report of the National Petroleum Council, April 1981, pp. 135-163.

Senator BRADLEY. Thank you, Mr. Rosapepe for your caution here. And we will carefully look at it, and hope that you would be available for further consultation.

I would like to thank Mr. Plummer and Mr. Horwich as well for your testimony today. I think that it has been very helpful. And I hope you won't feel that because the time was abbreviated that the Chair lacked appreciation for your testimony. I think it has been very helpful. And I am sure that 25 years from now graduate students will explore this issue. They will see your testimony in full. And will not know that it was abbreviated here.

Thank you very much.

The committee is adjourned.

[Whereupon, at 11:45 a.m., the hearing was adjourned.]

[By direction of the chairman the following communications were made a part of the hearing record:]

Massachusetts Institute of Technology
Alfred P. Sloan School of Management
50 Memorial Drive
Cambridge, Massachusetts 02139

Robert S. Pindyck
Professor of Applied Economics

December 14, 1981

Mr. William Taylor
c/o Senator Bill Bradley
United States Senate
Washington, DC 20510

Dear Bill:

I'm sorry to be so late in replying to your letter of November 21 regarding the scheduled hearings on Senator Bradley's Emergency Preparedness Bill. I have been somewhat overwhelmed with work, and therefore didn't feel able to volunteer to testify. In any case, I hope those hearings went well.

I am enclosing a reprint of a recent paper that you may have already seen. It is another paper by Robert Hall and me on how to respond to rising energy prices. If possible, I would like it included in the hearing record.

Please keep me informed as to the progress of the Bill.

Sincerely,

Bob Pindyck

Robert S. Pindyck

RSP/LPN

Enclosure

What to do when energy prices rise again

ROBERT E. HALL & ROBERT S. PINDYCK

With decontrol of oil prices and the proposed acceleration of natural gas decontrol, the Reagan Administration has reaffirmed the U.S. commitment to free markets for energy. No longer will federal policy try to shelter consumers from the costs of higher world energy prices. Even though energy prices are relatively stable today, another round of sharp oil price increases seems likely at some point in the next decade, and this time U.S. energy prices will be permitted to rise immediately as free markets dictate.

Our experience with the futility of energy price controls, especially with the consequent gasoline shortages of 1974 and 1979, and the natural gas shortages of the early and the mid-1970's, makes clear why a free-market policy for energy is an absolute necessity. Trying to depress energy prices below market levels brings the chaos of shortages and the longer-run costs of severe resource misallocation. Still, free-market policies will not eliminate the adverse effects of rising energy prices on the national economy. The fact is that energy price increases—particularly sharp and unexpected ones—reduce the level and growth of real national income, add to inflationary pressures, and raise unemployment. A free-market energy policy is no less desirable because of the destabilizing influence of energy

shocks, so we must design our national economic policy to respond to energy shocks and minimize their impact. Monetary and fiscal responses to further episodes of rapid energy price increases need to be thought through in advance. The challenge we face for the coming decades is to accept and absorb the *necessary* costs of rising energy prices without incurring additional *unnecessary* costs. If we can meet this challenge, changes in the market for energy will not threaten our prosperity.

As the world's deposits of inexpensive oil and natural gas are depleted over the forthcoming decades, higher energy prices relative to the prices of other products are almost inevitable. Only the highly unlikely discovery and exploitation of deposits of a size completely outside the range of current expectations, or the equally unlikely development of an inexpensive technology not based on exhaustible resources, could reverse the trend toward dearer energy. But the experience of the past decade shows that the move toward higher relative prices of energy is not likely to take place smoothly. Periods of rapid price increases—energy shocks as in 1974 and 1979—will probably alternate with longer periods of stable or even declining relative prices. A reverse energy shock is even conceivable, where the relative price of energy falls sharply. Still, the reasonable forecast at this time is for a two- to four-fold increase in the relative price of energy over the next two decades, taking the form of discontinuous upward shocks, rather than a steady increase. What will happen to the U.S. economy in the long run as energy becomes much more expensive? What will happen in the short run after the next energy shock? What macroeconomic policies are the appropriate complement to the free-market energy policies the nation has already adopted?

Rising energy prices have two distinct effects on the economy, and it is important to understand how those effects work. First, a higher price of energy has a *direct* effect by reducing the total real national income available for domestic consumption and investment. When foreign energy producers receive more for their products in real terms, the real incomes of energy consumers must fall, and even the best economic policy cannot change this. Whenever a commodity that is consumed directly or used as an input to production becomes more costly to import or to produce, the potential income of the economy is necessarily reduced. It does not matter whether the cost of energy increases because it is imported and a cartel raises its monopoly price, or because domestic energy sources become more difficult to tap as a result of reserve depletion. In either case,

the higher cost of energy will mean a lower real national income, which in turn means lower real wages, profits, and consumption levels. This reduction in real income occurs even if monetary and fiscal policies are used to keep the economy close to full-capacity output and employment.

Second, energy price increases that are rapid and unexpected also have an *adjustment* effect on the economy. In the aftermath of an energy price shock, inflation can be severe, unemployment high, and investment low. This adjustment effect cannot be eliminated entirely, but it can be significantly reduced through the proper use of economic policy. With the wrong policies, however, adjustment problems will be magnified, and may become a serious threat to economic growth and stability. It is this adjustment effect that led to the inflationary recessions in the United States (and many other industrial nations) following the 1974 and 1979 shocks.

Adjustment problems occur because our economy, like most industrial economies, is characterized by important rigidities in prices, in the use of inputs to production, and in wages. Prices of goods other than energy do not fall rapidly to reflect changes in relative scarcities, and inputs to production cannot be shifted quickly given new energy prices. Perhaps most important, real wage rates fail to fall quickly to the lower equilibrium level consistent with higher energy prices and reduced national income. Labor thereby prices itself out of the market, so to speak, and full employment becomes uneconomical.

Expensive energy means lower income

Inevitably, more expensive energy depresses the nation's command over goods and services. Even if higher energy prices had no effect at all on U.S. production of consumption and investment goods, costlier energy means that a larger fraction of production must be diverted to energy producers, domestic and foreign, and less to consumption and investment. In short, higher energy prices mean lower real national income. How large is the reduction?

The answer depends on the role and importance of energy in the economy, both in terms of its magnitude as a fraction of GNP, and the ability of consumers and industrial producers to conserve energy when it becomes more expensive. If the share of energy as a fraction of GNP were very small, then even a large increase in its price would have only a small effect on real income. Alternatively, if the demand for energy were highly "price-elastic" (that is, if it

were easy for both household and industrial consumers to substitute other goods for energy if its price rose), the impact would again be small, even if energy's share were large at the outset.

The cost share of energy as a fraction of GNP is about 8 percent in the United States, and this sets an upper bound on the extent to which an increase in the price of energy will depress real national income. If there were no substitution possibilities (if energy demand were completely price-inelastic), a 10 percent rise in the price of energy would reduce real national income by about 0.9 percent. But the actual impact would be smaller because there is some scope for substitution of other goods for energy. Although the statistical evidence is mixed, a consensus is beginning to emerge in favor of an overall price elasticity of about –0.6. Thus, a 10 percent increase in the price of energy would lead to approximately a 0.6 percent reduction in U.S. real national income.[1]

The situation would be better if we could produce much of our own energy at a low cost, since low-cost producers stand to benefit from rises in energy prices. But in the United States, a growing share of our energy is produced at a cost close to or equal to the world price. In terms of direct economic impact, we are not much better off than importing nations like Japan or Germany, because the labor and other resources devoted to energy production deprive the economy of the use of goods and services exactly as would be the case if the energy were imported. For this reason, the production of expensive synthetic fuels in the United States cannot provide an economic buffer against the rising cost of energy.

What do our numbers imply for American economic growth over the next two decades? To take a particular scenario, suppose that the price of energy in real terms (relative to the prices of other goods) were to rise smoothly for the rest of the century at an annual rate of 5 percent. Oil would be selling for nearly $100 per barrel in today's dollars in the year 2000—a price where oil would begin to be replaced economically by non-conventional fuels. It turns out that this hypothetical 5 percent annual growth of energy prices would depress U.S. real national income growth by about 0.3 percent per year, relative to what would prevail with stable energy prices in real terms.

In the absence of rising energy prices, real national income in

[1] For a discussion of the characteristics of energy demand, and some estimates of energy demand elasticities for the United States and other countries, see Robert S. Pindyck, *The Structure of World Energy Demand* (Cambridge: MIT Press, 1979).

the United States would grow at about 3 percent per year. From 1960 to 1973, average real income rose at a rate of about 3.8 percent per year, but a reduction to 3 percent is reasonable in view of diminished population growth and a likely slowdown in productivity growth for reasons other than energy prices. If energy prices rise at 5 percent per year relative to other goods and services, real income growth would be reduced to 2.7 percent per year. (Of course, this computation assumes a world free from surprises, whether relating to energy or other economic forces.)

Steadily rising energy prices would take away about a tenth of our total normal growth in real income. Such a development is unwelcome in an economy already suffering from lower rates of real income growth from other causes. Losses in real income brought about by expensive energy may add to social tensions, in view of the small total dividend from economic growth even under stable energy prices. And expensive domestic energy production can make little contribution to offsetting the real income loss of consumers when world energy prices rise.

Though the loss of income from costlier energy is significant in this scenario, it is certainly far from catastrophic. Real national income would still grow at about 2.7 percent per year. The most serious economic problems arise when energy prices increase sharply, rather than slowly and steadily.

Why price shocks are worse

The painful experience of the 1970's taught us that energy prices may rise in sharp unexpected jumps rather than along the smooth path which could be accommodated without serious dislocation. A sharp jump in energy prices reduces output and employment and pushes up the rate of inflation. Understanding the mechanisms through which energy shocks destabilize the economy is an important part of the preparation for likely repetitions of the shocks of 1974 and 1979.

The first event following a sharp rise in the price of energy is a burst of inflation. There is no fundamental economic law saying that prices in general must rise when the relative price of one commodity rises—prices of other commodities could just as well fall, and in fact should fall if there were no rigidities, and equilibrium could easily be restored. But the 1970's revealed that the United States and most other industrial countries have a bias toward sympathetic movements of prices in general when energy prices rise. Not only

do other prices fail to fall when energy becomes relatively more expensive but they actually rise.

The response of prices in the United States and elsewhere after the 1974 shock amply demonstrates the perverse behavior of prices. Between 1973 and 1975, inflation would have increased by only 3 or 4 percentage points had the contribution of the energy shock been limited to direct increases in the costs of production and the prices of energy consumed directly, and had wages and other costs remained unaffected. But because of the sympathetic movements of wages and non-energy prices, inflation worsened by 5.1 percentage points in the U.S. and by even more in Canada, France, Britain, and Japan.[2] The reinforcement of energy price shocks by induced upward movements in other prices is one of the most serious obstacles to smooth economic adjustment.

At the heart of the problem is the failure of wages to decline in response to increases in energy prices. In countries where wage-setting is highly centralized and subject to government influence, the problem can be almost overwhelming—Britain is the leading example. But even in the United States, where the government's role in setting wages is minimal, wages do not respond quickly to equate the supply and demand for labor. After three decades of steady growth in the purchasing power of earnings, wages did not easily accommodate the reductions in purchasing power necessary after the energy price shocks of 1974 and 1979. Instead of falling to the point where the total cost of production (counting both energy and labor) was roughly constant, wages remained unaffected or even rose a little when the sharp increases in energy prices occurred. Consequently, prices had to rise.

The automatic linkage of wages to prices through cost-of-living escalators adds to the problem. Escalators were an understandable adaptation to the erratic monetary policies and high inflation rates of the late 1960's and an early 1970's, but during energy shocks they push wages in the wrong direction. The United States, like most advanced economies, had difficulty making the necessary adjustment to the lower real wage-rate necessitated by higher energy prices. There is some evidence of improvement in wage-setting both in the U.S. and Western Europe—the economic problems touched off by the 1979 shock seem to have been milder than those from the 1974 shock, even though the 1979 shock was at least half again as large

[2] For a discussion of some of the international differences in the effects of energy price shocks, see Robert E. Hall and Robert S. Pindyck, "Oil Shocks and Western Equilibrium," *Technology Review*, May 1981.

as the earlier shock. In countries like the U.S., where employers are free to set up their own wage-setting arrangements, the perverse responses created by automatic cost-of-living escalation may induce greater institutional flexibility. Still, the problem of rigid wages is a long-standing one, and we may therefore expect inflationary dislocations in the wake of future energy shocks.

Soon after the burst of inflation set off by an energy shock, real output falls. The recessions of 1975 and 1980 followed soon after the rapid increases in oil prices. Further, these recessions were worldwide, which increased their severity in each country individually. The recessions induced by energy shocks involved declines of real output of 5 percent or more, far in excess of the direct reduction in real income we discussed earlier. When reckoned in terms of present discounted values, the total economic cost of the recession created by suddenly higher energy prices may have been as large or even larger than the cost of the higher energy prices themselves over the indefinite future, even though the recession itself lasted only a few years.

The real output level of a modern economy is vulnerable to an energy price shock for a number of reasons. First and foremost is the inability of the economy to come back to equilibrium quickly at a new and lower real-wage level. After a shock, employment falls and unemployment rises as firms lay off workers rather than employ them at uneconomic wages. This in turn brings a drop in real output. Sudden changes in input prices then create uncertainty about the profitability of private investment. Together with the high interest rates which accompany a suddenly higher price level, this uncertainty can bring about a slowdown in investment demand. Consumption demand will also fall (immediately and permanently) in response to the bad news about current and future real incomes. In the longer run, export demand from foreign energy producers should offset declines in domestic demand, but the experience of the 1970's showed that this process takes some time. In the interim, there may be several years of depressed output and higher unemployment.

Because of the strong interactions between the U.S. and other major economies, the recessionary impact of an energy shock within any single economy is substantially larger than a purely domestic shock of the same magnitude. The business cycles of the major energy consuming nations were out of synchrony before the 1970's, but in the period 1973-75 and again in 1980 all of their economies went into recession in a strikingly uniform way. These inter-

actions between countries exacerbate the adjustment effect of an energy shock.

Coping in the short run

In the long run, economic policy can do little to reverse the decline in resources available for investment and consumption following energy price increases. The one policy move offering some hope of raising real incomes in the longer run—reduction in current excessive taxation of the earnings of capital investments—is something that needs to be done quite apart from energy considerations. For the longer run, the major policy instruments, monetary and fiscal, should be directed toward broad goals not specifically related to energy. Monetary policy should be geared to stabilizing the price level; there is no reason to let higher energy prices or other events divert monetary policy from this goal. On the fiscal side, taxing and spending policies should provide the desired level of government services and income maintenance without imposing excessive distortions. Higher energy prices have only one role in the process in the longer run—they reduce total resources available for all purposes and must necessarily reduce the appropriate levels of government programs as well.

The role of economic policy during and immediately after an energy shock is more complex. The combination of higher inflation, higher unemployment, and lower real output strains conventional ideas about policy in the short run. The inflation seems to call for increased monetary stringency. Though the only effective tool of economic policy for controlling inflation in the longer run is stabilization of the money supply, monetary contraction is largely ineffective against inflation in the short run. Instead, a strenuous monetary response to an energy shock brings a worsened recession. In 1974 and 1975, reductions in money growth were responsible in part for the severity of the recession of those years. By contrast, the country with the most favorable experience with inflation following the 1974 shock, Germany, did not reduce—or increase—its rate of money growth; it simply maintained a policy of moderate money growth.

Monetary policy should not be used to try to offset the inflationary effect of an energy shock. Rather, money growth should be guided by the general principle of providing the economy with the quantity of money that is non-inflationary in the long run. In the short run, monetary policy should simply provide a stable monetary environment for private economic decisions—it cannot and should

not try to stabilize prices from year to year, but instead from decade to decade.

Fiscal policy faces a dilemma in the aftermath of an energy shock. On the one hand, there is pressure to lower tax rates on consumers to make up for the loss in real income brought about by higher energy prices. But even without cuts in tax rates, government revenues decline in real terms because higher prices for imported energy, combined with diminished levels of economic activity, will reduce the real tax base. On top of this may come pressure for higher levels of government spending to stimulate demand.

Higher government deficits over a number of years are likely to follow an energy shock and do not by themselves present any serious economic problems. However, it is important that fiscal policy makers recognize that higher energy prices inevitably bring a decline in real national income. It is simply impossible to maintain real growth in government expenditures *and* cut taxes enough to maintain real growth in consumption when the total resources available for domestic purposes have been reduced by higher energy prices. Although budget deficits are sensible during the recession that follows an energy shock, the growth of revenues must be large enough to eventually finance the growth of expenditures. If the government chooses to keep expenditures in real terms at their pre-shock levels, then tax *increases*, not decreases, will be needed sooner or later. With constant tax rates, government expenditures must share in the decrease in real national income. Accordingly, any increase in expenditures and reductions in taxes following an energy price shock should be small and temporary.

There is more to short-run fiscal policy than the resource allocation issues just examined. Well-designed temporary tax policies can moderate the recessionary effect of an energy shock.

First, special temporary incentives should be used to stimulate investment in the aftermath of a shock. As we explained earlier, sharp increases in energy prices depress investment demand, and this in turn can retard potential GNP growth for years to come. Investment credits, accelerated depreciation, and their equivalents are good ways to stimulate demand in the short run. Pro-investment policies also have the virtue of helping to offset inflation by adding to productive capacity and thus increasing aggregate supply.

Second, tax policies can reduce business costs and so lower prices and raise output. Cost-reducing policies provide a way for the government to introduce the flexibility that modern economies seem to lack in the short run. Reductions in payroll and excise taxes are

leading candidates. Their effectiveness has been demonstrated in reverse by the recent British experience of *raising* indirect taxes. A good part of Britain's high inflation since 1979 is the result of this mistaken policy. Reversing the British policy is an attractive move after an energy shock, but effective options for cost reductions are limited in scope. Cuts in the payroll tax would require modifications of existing fiscal institutions, because the tax is now earmarked for the specific purpose of financing Social Security benefits.

How to make things worse

Though the Carter and Reagan administrations have moved us closer to a free-market energy policy, there remains the danger of a resumption of federal intrusion in energy markets at some time in the future. The experience of the 1970's taught us an important lesson—when the government keeps fuel prices below market-clearing levels, shortages inevitably follow. Further, once shortages occur, the government is forced into the business of allocating scarce supplies because price controls block normal market mechanisms. Federal price controls for gasoline and accompanying blundering attempts to allocate gasoline in 1974 and 1979 had social costs far in excess of the limited relief they provided to gasoline purchasers. Experience around the world has amply demonstrated that the only successful way to avoid fuel shortages is to rely on free market pricing and allocation.

Except in the event of a major war, the United States can rely on the continuous availability of crude oil in the international market. World shortages of crude oil are not a threat. As long as oil is being produced, anyone can—by offering a high enough price—import as much as desired, so the world market will equalize supply and demand. Federal energy policy should therefore not focus on alleviating shortages or closing gaps. The U.S. will see energy shocks in the future, as it has seen two shocks already, as a sudden sharp increase in the world price of oil. Even the conscious attempt of the Arab oil producers to boycott the U.S. in 1973 and 1974 was a complete failure in hurting the U.S. differentially—the whole world suffered equally from the higher prices it brought.

Should the United States continue to accumulate a strategic oil reserve? This depends on whether the benefits outweigh the costs. A strategic reserve has two functions. First, in the event of a war that disrupts most shipping and trading of oil, the reserve could be released into the North American market to moderate the price in-

crease in that market, which would be forced to function independently from other oil markets. Second, even if the world market continued to function, the reserve could be used to moderate world price increases in the wake of an OPEC production cutback.

A U.S. strategic reserve makes the most sense if it is part of an international multilateral agreement. When a stockpile is released, no matter where it happens to reside, it adds to the supply of oil in the world market (barring a major war) and thereby lowers the world price. As a result, the benefits are enjoyed by all importing countries, even if they do not have stockpiles of their own, but the benefits to the country holding the stockpile are likewise reduced. If the U.S. alone released a stockpile in the wake of a crisis, the impact on world oil prices—and prices faced by American consumers—would be small, even though U.S. oil imports would fall substantially. But if most major oil consuming nations maintained and released large stockpiles, sharp price increase could be moderated significantly and the resulting economic damage ameliorated. The likelihood of obtaining such an international agreement is extremely low. At the same time, the costs of building and operating the storage facilities have proven to be much higher than previously estimated. Consequently, the U.S. should proceed cautiously in accumulating strategic reserves unilaterally.

Another element of federal energy policy under discussion today is the taxation of energy. A simple tariff on imported oil would raise the domestic prices of all forms of energy, stimulating supply and discouraging consumption. By reducing dependence on energy, the tariff would reduce U.S. vulnerability to future energy shocks. Further, reduced U.S. oil imports might lower the world oil price somewhat. The benefits on both accounts must be set against the costs: Tax-induced rises in energy costs have all the same inflationary and recessionary effects as those from OPEC, and the costs to U.S. consumers of higher energy producers exceed the proceeds of the tariff. If an oil tariff is imposed, it should be done gradually, with substantial advance warning.

It should hardly be necessary to add that the government should stay completely out of energy production. Nothing but waste and inefficiency can come from federal involvement in synthetic fuels, breeder reactors, and other technologies that cannot make their way in free markets.

Energy prices are likely to continue to rise relative to other prices, possibly in sharp and unexpected bursts as in 1974 and 1979. More expensive energy imposes significant costs on the American econ-

omy—lower real income in the longer run, higher inflation and unemployment in the shorter run. But the costs should be manageable, even if energy prices triple in real terms over the next two decades. The challenge will be to adopt the economic policies that most successfully limit the costs and to block the energy policies that threaten to raise the costs.

Under the policy mix we favor—mildly activist tax policy and free-market energy policy—energy price increases would still impose costs on the U.S. economy, especially if those increases were sharp. But those costs are largely unavoidable, and they would only be exacerbated if we tried to meet them with the mistaken, deeply interventionist policies of the past decade.

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